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Color Micro Journal"

The Color Computer Monthly Magazine

\$1.95 per issue Vol. 1, Issue 2 October 1983

THIS 'N THAT

The **BIG NEWS** this month is that OG-9 has finally arrived for the Color Computer. The ASTOUNDING part of the Radio Shack OS-9 Package, besides the price, is the DECUMENTATION. You 'Old Time Radio Shack Followers' will not believe what you see. Jon Shirley has been telling us that the main reason for the "lack" of documentation with a lot of their, products was the restrictions placed on releasing that information by Microsoft; I am becoming a believer. I have maintained all along that if you have a viable product, the DOCUMENTATION will be the "make or break" factor; especially with a 'strange' product. UNIX Users would have little trouble using OS-9, but I'll wager that not many of the Color Computer Users have much of that kind of a background. Since we feel that the OS-9 Operating System could easily become the PRIMARY Operating System for 6809-Based Computer Systems (and possibly 68000-Based, also), we have devoted quite a bit of space in this issue to OS-9, and will continue to do so in the future (take note, OS-9 Users, we are looking for Articles, Programs, Hows and Ways, etc.).

We have been running a "Preliminary Release" of the CoCo OS-9 for a little while now, and just received an "Official" Package from Radio Shack. The System works just like it does on the "BIG" Systems (GIMIX, Helix, etc. — we have a GIMIX III System set up with the Level III OS-9; a special Level II which takes advantage of the "Smart" I/O Boards, Hardware Protection, etc.), except for the Keyboard 'type ahead' feature. This does not work when the Disk Drives are

Continued on page 27



OS-9 on the COLOR COMPUTER

One of the "Operating Systems of the Future" is now available for the "little old Color Computer"; 08-9. Freely translated, OS-9 means "Operating System for the 6809" (OS-9 is now being written for the 68000, also). Since it is fairly obvious that UNIX and "UNIX-Type" Operating Systems will be running on just about every computer to come out in the next few years, a whole new language is beginning to appear on the horizon. Terms like "Multi-User", "Multi-Tasking", "Pipelines" Redirected I/O", "Rodules" and "Modular Design", "Device Independence", "Position Independent", "Recursion", etc., etc., etc. With a 64K Color Computer and a Disk System (between \$1000 and \$1200 cash outlay), you can get a BIG jump on the future, and have a lot of FUN in the process.

System Requirements and Limitations

To run OS-9, you must have a 64K Color Computer (or "look-alike") and at least one **Disk Drive System**. OS-9 Disks are NOT compatible with Radio Shack Formatted Disks (nor are the Radio Shack OS-9 Disks compatible with OTHER OS-9 Systems, such as GIMIX, HELIX, etc.). The supplied OS-9 Disk Drivers will support up to 4 Single Sided, 35 Track Disk Drives, in either Single or Double Density Format. There is no provision, to MY knowledge, for Double Sided Drives (although we "hear" that Radio Shack IS coming out with Double Sided Drives for the Color Computer). That, Lads and Lasses, is just about the sum and total of the NO's and NOT's about this System; overall, the complete package is FANTASTICI

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Color Computer OS-9; the Package

We had been running a preliminary release of OS-9 on the Color Computer for a few weeks, and received the "Official Radio Shack" version for Review a couple of days ago. To put it mildly, this package is **IMPRESSIVE**! For \$69.95 (Radio Shack Catalog Number **26-3830**), you receive a 9 1/2" x 7 5/8" x 2" package containing 4 Manuals and 2 Disks.

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by Days Hooper and Mark Barnes from Prickly Pear Fantastic graphics oriented Hi-Res flight simulator has 2 speeds, 4 difficulty levels, views from top and side, instrument panel and realistic joystick control. Don't crash or have to "go around!" Can you land on the runway to hear the synthesized voice say "perfect landing"?

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Unix*-based, multitasking, modular, and versatile: these key features are some of the reasons why more 6809 computer manufacturers have selected OS-9 as their standard operating system than any other. And OS-9 has been put to work by thousands of users in almost every conceivable computer application in business, science, industry, education, and government.

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OS-9's advanced features unison the performance potential of atmost any 6809 computer — large or small in many respects the OS-9/ 6809 combination is more powerful than many minicomputers.

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The Manual set includes Getting Started With OS-9 Manual, 34 pages; folded. OS-9 Commands Manual, 140 pages; spiral wire bound. OS-9 Program Development Manual, 174 pages; spiral wire bound. OS-9 Technical Information Manual, 178 pages; spiral wire bound.

There is a Disk in the Commands Manual and one in the Technical Information will set the date and time to 1:27:30 PM Manual. These Disks consist of a Radio Shack formatted OS-9 BOOT Disk which contains a short BASIC Program named """, and a Binary Program which has two parts; a Disk RPM Test Routine and the OS-9 Boot Routine for Disk BASIC VI. 0 ROM. The other Disk is the OS-9 System Master Disk, which can be booted with the "DOS" Command in the Disk BASIC VI.1 ROM. It consists of OS-9 Level I, **Version 1.2** and also includes the **Text**. Editor, the Special OS-9 Assembler (designed for the modular, multi-tasking environment of OS-9 and optimized for use by the high-level languages such as Pascal and C), and the Interactive

Color Computer OS-9; DOCIMENTATION

PASS THE CROW, PLEASE (may I have some Mustard with it?). If you read my it comes from Radio Shack. remarks about the CoCo OS-9 in the Color Micro Journal Editorial last month, you know that I said that if Microware and Radio Shack could write a Manual for OS-9 that would allow people who are NEW to Computers to be able to use OS-9 effectively, they would have performed a miracle. Folks, they HORE THAN PERFORMED A MIRACLE; the Manuals are FANTASTIC! It is my belief that the DOCUMENTATION can "make or break" a major program; if that IS the case, this Radio Shack package is a SURE WINNER.

All Manuals are 9" x 7" in size, and, except for the "Getting Started" Manual, are about 1/2" thick. You probably were not too "thrilled" with the original set of BASIC Manuals that came with the Color Computer; little INFORMATION, little ORGANIZATION, little or no INDEX, etc. Well, I'm happy to report, there is NO similarity between the new OS-9 Manuals and the original BASIC Manuals; ABSOLUTELY NOWE! These new Manuals are well structured, concise but complete, and WELL ORGANIZED, REFERENCED, and fairly well INDEXED; with numerous internal references to other sections of the Manuals for "more information".

Manual; "Getting Started With OS-9"

The "Getting Started With OS-9" Manual is the starting point, and is strictly Radio Shack Color Computer OS-9 oriented. It starts with a Chapter on "What Is OS-97" Which begins with "What Is an Operating System?" (Hallelujah!), and then takes a quick look at QS-9, the Multi-Level Filing System, Multiuser/Multitasking Operation, and the Device-Independent Input/Output System. The next Chapter runs through the Disk Drive RPM Test procedure.

Chapter 3 covers "Starting Up OS-9". Basically, if you have a V1.6 Disk RCM, you install the OS-9 BOOT Disk and RUN"*"; select "b" when the "Boot or Test" Option is requested, insert the OS-9 System Master Disk when asked, and hit "any key" to get OS-9 on line. If you include the Command Structure, some

have a V1.1 Disk ROM, simply insert the OS-9 System Master Disk and enter the Command 'DOS'. In either case, you will get a Screen Full of OS-9 Copyright notices, and a

YY/MH/DD BB:MGSS

prompt. Answer this, either exactly as it is requested, or by inserting spaces in place of the "/" and ":" shown (for example, entering

83 9 10 13 27 30 cm>

on Sept. the 9th, 1983 -- OS-9 works with a 24 hour clock). You can quit with the date, and the clock will start at 00:00:00. After it is happy with that entry, you will receive the OS-9: prompt. The whole thing takes 15 to 20 seconds.

"Getting Started" then walks you through FORMATTING DISKS AND MAKING BACKUPS. It is oriented towards a Single Disk System, but includes an explanation of the procedure for "Two-Drive Users" also. The supplied OS-9 System CAN be used on a Single Drive System; all Commands such as FORMAT, COPY, BACKUP, etc., will prompt for Disk Exchanges if you try to accomplish them to /DØ. If you are using a Single Disk System, I would suggest you delete the "DEFS" Directory (see the DELDIR Command), AFTER you have made your BACKUP Systems Disk, to free up some space on that Disk; it is pretty FULL as

After the Manual gets you up-and-running on your backup disk, they move on into "EXPLORING THE OS-9 FILE SYSTEM" by discussing this powerful feature, and then creating and deleting some files and directories. Then there is a discussion of the Error Reporting System and PRINTERR Command, and a final chapter which presents a "quick look" at some of the Common Commands and Command Modifiers (Alternate Memory Size, I/O Redirection, Concurrent Execution, and

All in all, an outstanding job of leading a new user through getting the OS-9 System "up-and-running" smoothly, while keeping him informed of the "Whys and Wherefores" in the process. Even for the experienced OS-9 User, this book is a MUST; it won't take long to go through it, and it does not get boring. Talk about Top-Down Problem Solving; this book accomplishes it in SPADES! It also provides the required background for understanding the next book in the series to be "consumed" by the User; OS-9 Commings.

Manual: "OS-9 Commands"

The "OS-9 Commands" Manual is effectively organized into three parts; five Chapters on the OS-9 System and its operation, a Chapter covering the complete Command Descriptions, and four Appendixes covering the Error Codes, Display System Functions, Keyboard Codes, and Keyboard Control Functions.

Chap. 1 presents an introduction to the "Shell", which is the Program which interprets the Users Commands for the OS-9 System. While OS-9 is extremely powerful, it is also extremely complex, internally; Shells' job is to make this complexity invisible to the User. Any time you see the "OS-9:" prompt, the Shell is active and awaiting your command. Topics covered in this Chapter

Common Command Formats, Using the Video Display and Keyboard, and Sending Output to the Printer. Chap. 2 introduces the OS-9 File System, discussing the Unified I/O System, the Organization of the File System, Directories, the File Security System, and Reading and Writing from

With the background of the first two chapters, Chaps. 3 and 4 then investigate the Advanced Features of the Shell and Multiprogramming and Memory Management. Chap. 3 covers "More About Command Line Processing", "Execution Modifiers", "Command Separators". "Command Grouping", "Built-in Shell Commands and Options", "Shell Procedure Files", "Error Reporting", "Running

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Compiled Intermediate Code Programs" (such as compiled BASIC0909, Pascal, etc.), and "Editing startup for Timesharing Systems". Chap. 4 discusses "Processor Time Allocation and Timeslicing", "Process States", "Creation of New Processes", and "Basic Memory Management Functions". While it may seem confusing just reading through all of these items at this time, the Manual starts out "easy", and develops each subject as you go (those of you who are familiar with the terminology can begin to see the POWER of this Operating System). It also provides NUMEROUS Examples along the way; as you are reading about these different features, you are entering Commands that DEMONSTRATE each topic. Remember, this is NOT a discussion of what CAN be accomplished with Specialized Programming; ALL OF THESE CAPABILITIES ARE EASILY CONTROLLED FROM THE COMMAND LINE!

Before we continue with the "OS-9 Commands" Manual, lets look at a few simple examples to get a "feel" for using the OS-9 System. Commands from the Keyboard begin with a Program Name, followed by the Filename to be operated on, and any "parameters", or variables. For example,

OS-9:list letter<cr>

would cause the Command named "list" (or List, or LIST; OS-9 ignores Upper Case and Lower Case differences for names from the Command Line) to work on the File named "letter"; in this case, list the file named "letter" to the Display. Also, ALL Command Line entries are terminated with a Carriage Return (the ENTER Key), so we will drop that from the examples. Finally, the "OS-9:" shown preceding the

..

Printer. We can "re-direct" the Output from the Display, where it normally goes, "parameter", the ">" symbol, like so;

OS-9:list letter >/p

Now, the output will be sent to the Printer; the Printers "Name" is "/p". In OS-9, ALL Device Names begin with a slash; /dØ is Disk Drive 0, /dl is Disk Drive 1, /term is the Color Computer Keyboard and Display, /tl is the Second Users Terminal hooked to the Color Computer's Serial connector (yep; Multi-User), etc. You can use an entry like

OS-9:list letter | tee /p /dd/letter file

and get a listing of the file named "letter" to **BOTH** the Printer (the "/p") AND to another File on Drive 0 named "letter file" at the SAME TIME. This also shows some of the Shells work, in that the exclamation point (1) causes the Output to be "piped" to the "tee" Command, which handles sending output to two different places at the same time. The term "pipe" means to take the output of a program, in this case "list", and use that as the INPUT for the next program, in this case "tee". (Have you tried to get a Radio Shack DIR Listing On the Printer? There ain't no way without a special program written specifically to list the Directory out to the Printer!) As a matter of FACT, OS-9's "Unified I/O System" allows you to send just about ANYTHING to ANYPLACE at ANYTIME from ANYWHERE! Hows that for flexibility?

Back to the "OG-9 Commands" Manual.

Command is the normal OS-9 prompt from Manual has led you through an the Shell. But, suppose we wanted to introduction to the Shell and the OS-9 Print the file named "letter" on the File System, and then gone into greater detail in discussing the Shells' REAL capabilities and the operation of OS-9 in to the Printer with a Command Line running Multiple Programs and its Memory Utilization. Chapter 5 discusses the "Use of the System Disk" through examining the "OS-9 Boot File", "The SYS Directory", "The startup File", "The CMDS Directory", "The DEFS Directory", "Changing System Disks", and the important subject of "Making New System Disks". By this time, you are to the point where you can effectively USE the OS-9 Operating System, because you UNDERSTAND what is happening, and HOW to accomplish various tasks as you need

> Chap. 6, the final chapter in the Manual, presents the "System Command Descriptions". This is a DETAILED discussion of EACH Command, in alphabetical order, with examples of syntax and results. You may want to put a tab at the beginning of this section, because you will be referring to it often as you use the OS-9 System. A summary of the provided Commands follows:

attr - Change file attributes backup - Make a backup of a disk

bines - Convert binary to s-record

build - Build a text file chd - Change working directory

chx - Change execution directory

cmp - File comparison utility cobbler - Make a bootstrap file

copy - Copy data

date - Display system date and time dcheck - Check disk file structure

del - Delete a file

deldir - Delete all files in a directory dir - Display file names in a directory

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display - Display converted characters deswe - Generate procedure file to copy files

damp - Formatted file dump

echo - Echo text to output path exhin - Convert s-record to binary fixemat - Initialize disk media

free - Display free space on a device

ident - Print OS-9 module identification

kill - Abort a process

Link - Link module into memory

list - List contents of disk file
load - Load module(s) into memory
login - Timesharing system log-in

makdir - Create directory file makir - Display memory directory merge - Copy and combine files

mfree - Display free system RAM memory OS9Gen - Build and link a bootstrap

printerr - Print full-text error msgs

procs - Display processes
pwd - Print working directory
pwd - Print execution directory

rename - Change file name save - Save memory module on a file

setime - Activate and set system clock
setpr - Set process priority

sleep - Suspend process for period of time

shell - OS-9 command interpretertee - Copy standard input to multiple output paths

twode - Change terminal operating mode

temon - Timesharing monitor unlink - Unlink memory module

verify - Verify or update module header and CRC

zmode ~ Examine or change device initialization mode

The rest of the "OS-9 Commands" Manual consists of a listing and description of the Error Codes in Appendix A. discussion of the "Display System Functions" covering the Alpha Mode, with the 10 Control Codes supplied for simulating a typical computer Terminal; the Graphics Mode Display, which presents the Graphics Control Commands (such as Set Color, Draw Line, Draw Circle, Cursor Positioning, etc.); and accessing the Joysticks is included in Appendix B. Appendix C provides the Keyboard Codes (full ASCII coverage); and Appendix D covers the Keyboard Control Functions. Some of the information in the Appendixes is oriented towards Assembly Language access and utilization of the functions with the normal OS+9 "System Calls" (which are fully explained in the OS-9 Technical Information Manual), but can also be used through BASICF9, Pascal, C, etc.

The "Getting Started" and "Commands" still at \$0400. Manuals contain all of the information are still in that you need to be able to USE OS-9. Will discover Every OS-9 System Owner will need to know a Users Prograthese two Manuals inside out. The other two Manuals will become more valuable as you become more familiar with the FLEXIBILITY. Operating System.

Manual; OG-9 Program Development

The "OS-9 Program Development" Manual covers the three "working" Programs that are supplied with the package; the Macro Text Editor, the Assembler, and the Interactive Debugger. Both this Manual and the "Technical Information" expect you to be familiar with the 6809 Instruction Set. We will look at these three programs in detail after looking at OS-9 next month.

Manual; OS-9 Technical Information

The final Manual in the set is the OS-9 Technical Information Manual, which (to quote from the Introduction in the Manual) "provides all the information necessary to install, maintain, expand, or write assembly-language programs for OS-9 systems. It assumes you are familiar with the 6809 architecture, instruction set, and assembly language." The first chapter discusses the "System Organization", introducing the Kernel, Clock, and INIT Modules, the Input/Output Modules, the Shell, and the Boot Module. Chap. 2 then delves into the Kernel, Chap. 3 discusses Memory Modules, Chap. 4 the Unified I/O System, Chap. 5 the Random Block File Manager, and Chap. 6 the Sequential Character File Manager. Each of these major Sub-Systems are presented in DETAIL, including their function, operation, and Assembly Language interfacing.

Chap. 7 discusses Assembly Language Programming Techniques as they apply to the OS-9 System, including how to write Position-Independent Code, Addressing Variables and Data Structures (which are almost NEVER at a fixed Memory Address location), the Stack Requirements, Interrupt Masks, Using Standard I/O Paths, Writing Interrupt-Driven Device Drivers, and provides a Sample Program (the LIST Command). These are generalized discussions which present "guidelines", not details. Chap. 8 provides about 75 pages of detailed "System Call" descriptions.

The Appendices provide an Alphabetical System Call List, Numerical System Call List, detailed Memory Module Diagrams, the Standard Floppy Disk Format, System Call Error Codes, and Module and I/O Attributes.

Manuals; Summary

There is at least one full nights reading in these four Manuals; if you just SKIM them. As I stated at the beginning; an EXCELLENT Set of Manuals that are professionally packaged and professionally organized. If you need some kind of information, it is probably there SOMEWHERE; all you have to do is study them. Again, I caution you, DON'T expect to see a lot of fixed Addresses in these Manuals: not because they are not providing that information, but because OS-9 has VERY FEW Fixed Addresses within the System. Everything is relative to everything else. The Display Screen is still at \$0400, and the Interrupt Vectors are still in the \$0100 area, but, as you will discover when you study the Manuals, a Users Program may load ANYMHERE in the Memory Area. Such is OS-9, and that is where it derives it's POWER and

Let me close this discussion of the Radio Shack OS-9 System Documentation with a couple of suggestions for "Reference Manuals" that you will find INVALUABLE in working with OS-9. The first is the "Old Standby" Programmers Reference

6809 Assembly Language Programming

Lance A. Leventhal
published by
OSBORNE/McGraw Hill
630 Bancroft Way
Berkeley, CA 94710

The second book that I cannot recommend too highly, ESPECIALLY for anyone who plans on writing Assembly Language Programs for the OS-9 Operating System, is

Microcomputer Architecture & Programming by

John F. Wakerly published by John Wiley & Sons

This book provides the "Bow To", where Leventhal provides "What to do it With". It is easy to read for a technical book, is heavily 6809 oriented, and covers everything from an introduction to Pascal (which is used to show the "structural concepts" of the s viect being discussed), the Number stems, Basic Computer Organization, Assembly Language Programming including the Assembler and Relocating Assemblers and Loaders, through Subroutines and Parameters, Input/Output, Interrupts, DMA, and Processes, and Program Development. It has excellent discussions of Recursion, Coroutines, Stacks, Queues, Static and Dynamic Parameter Allocation, etc.; normally with 'pseudo 6809' Code examples. It also provides an excellent comparison and analysis of the PDP-11, 68000, 28000, 9900, 6809, 8086, and MCS-48 Microcomputer Architectures. (Wakerly is available from Southeast Media Supply for \$24.95 plus shipping - call 800-338-

--- RIN ---

Simplified MENU Programming

Books and magazines encourage menu style programming because it makes a program easier to learn to use. Writing the extra code needed to print out a menu, and then the chain of IF/GOTO statements demonstrated in these books is a tedious process that turns many programmers away from menu programming.

Part of this tedium can be relieved by using the INSTR Function of Extended Color BASIC to determine the argument for an ON/GOTO or ON/GOSUB statement.

Here is a program segment that demonstrates this trick:

100 CLS

110 PRINT "OPTIONS..."

120 PRINT " [L]OAD A FILE,"

130 PRINT " [O]RDER THE FILE,"

140 PRINT " [P]RINT A FILE,"
150 PRINT " [S]AVE A FILE,"

150 PRINT " [S]AVE A FILE,"
160 PRINT " [E]XIT THE PROGRAM,"

170 PRINT " YOUR SELECTION": A\$

180 AS=LEFT\$(A\$,1)

190 ON INSTR("LOPSE", A\$) GOSUB 1000, 2000, 3000, 4000, 5000

200 GOTO 100

If A\$ is not "A", "O", "P", "S" or "E" control will pass to line 200. See your Extended Color BASIC Manual for a complete description of the INSTR Function.

Troy Brumley



COLOR COMPUTER WORKSHEET

Klite Software Box 11224 Pittsburg, PA 15238

Regs. 16K Ext. BASIC Tape or Disk \$44.95

ELITE*CALC is an extremely powerful worksheet, and for around \$45, it must be the all-time best software buy for the Color Computer. For the beginner who started with Radio Shack's "SPECTACULATOR" version of the spreadsheet, HITE CALC is a spectacular improvement. It is not limited to formulas that must apply to entire rows or columns, and its machine language is much faster. For the more advanced computerist who is familiar with Supercalc type spreadsheets, you should feel right at home with the performance of this software.

The worksheet has 255 numbered rows and 255 columns that are labeled A thru IU. Many Other products only have 100 columns, 30 rows deep. This is bigger than a 64K Color Computer can use completely, yet it will run on a 16K or 32K machine. My 64K machine had 20677 bytes available for headings, formulas and data.

The commands are all one key entries, using the first letter of the command word. This makes for minimum typing overhead and is easy to remember. And if you do forget, the entire list is just a (7) away. The range of commands should satisfy even the most demanding user. They are almost luxurious to the occasional home computerist and more than adequate for the business user of the Color Computer.

You can COPY words to other cells individually or in entire blocks, REPLICATE numbers or formulas to entire columns or rows, BLANK out large blocks or specific cells, DELETE or INSERT rows or columns, HIDE rows or columns from screen or printer, or MOVE cells, rows, columns, or whole blocks to another location. The really good news is that you can Sort rows or columns, in ascending or descending order; and the whole line moves with the sorted cell. Lists can be alphabetized by names, or reordered by ages, or prices, or other number lists.

The entire Radio Shack EDTT routines are available for formula or text changes, and the complete set of EXTENDED BASIC functions can be used in cell formulas. Another handy feature is LOOKUP; it can be used to look up a value in a file of up to 255 items, and select a corresponding value to be used in a cell formula. Only your own imagination would limit your use of this feature. Several other similar features are AVERAGE, COUNT, MAX, and MIN, that can look at a range of cells and calculate the unique value that you asked for.

Moving around the worksheet is accomplished by the four standard ARROW keys, and they repeat as long as you hold the key down. The AUTOMATIC mode will advance the cursor in the same direction

immediately to any cell you specify.

The FORMAT command (F) instructs the computer to place COMMAS in large numbers, place DECIMALS where needed, use DOLLAR signs, ROUND-OFF to integers, LEFT or RIGHT justify numbers and text separately, insert MINUS signs, and several other variations such as COLUMN or ROW WIDTH, SCHENTIFIC notation, etc., to customize the spreadsheet to your own desires. These formats can be applied to a single cell, to a whole or part of a row or column, or to a complete block of cells; just about any range you specify.

GRAPHIC BAR CHART: this built-in feature can display or print a bar chart to graphically illustrate a group of values that have been calculated or input. An asterisk (*), or any user-defined symbol can be used to form the chart bars.

The Spectaculator user will certainly appreciate the HIDE command. This feature allows you to look at two parts of the rows, or two parts of the columns, at the same time. The gap between visible portions can be one or many rows (or columns). Its main advantage is to always be able to see the column headings while the lower areas of the worksheet are being used. This is not as good as Multiplan's four windows, but then Multiplan is not available for the Color, screen. ELITE CALC uses this format; Computer, and has a few more 0's on the they do it as a matter of design choice. price tag.

PRINTING your worksheet is as simple as specifying the corners of the block to be printed. A predetermined TITLE will be placed on each page. The printing format is user controlled including

as the last move after each computer CONDENSED or EMPHASIZED characters, PAGE entry. JUMP will move the cursor LENGTH, LINE WIDTH up to 132 characters, and BAUD rate.

> Up to now this article has mentioned the good points of **ELITE*CALC**. So, to be fair to you as a potential user, the few not-so-good points will be presented next. However, they are very few and may not even be considered a problem to most of the average users of the system. The formulas that have been set up for the individual cells can be reviewed (and changed) by using the EDIT routine; it would be nice if the formulas appeared as each cell was stepped through. This compromise does provide for quick and complete editing, however.

> The "Formats" that have been setup can NOT be reviewed at all; you CAN observe their effects in individual cells and it is easy to change the format. procedure recommended by the supplier is to set up the formats as they are needed; you shouldn't need to review them later. Another procedure is to write down the formats for each cell range as they are set up; this form of selfdocumentation is a good habit to acquire,

> A minor peeve of mine is probably a matter of opinion concerning the screen size. As you know, the Color Computer normally works with a 32 character video The 51x24 screen and other larger sizes were considered, but decided against, in favor of the easier-to-read larger characters on the 32x16 screen. This choice does not seriously affect the usefulness of the worksheet.



My last negative comment concerns a problem I had while running the software. It may have been a problem in my computer, rather than the fault of the programs; I report it only because it happened! I was setting up a apreadsheet for my investment stock portfolio which had 53 column headings for the various entries and calculated values. It is a very complicated and involved program with long, sophisticated formulas. The remaining available memory (which is always shown on the screen) was 4539 bytes. I was trying to replicate a formula in column AH into 40 other cells. Suddenly the screen started shaking, the memory indicator started flashing, and it stayed like that for the next 10 minutes. I finally "reset" and started over from ! the last disk file I had previously; "saved". This happened one more time, but I never found out why.

The **ELITE** CALC spreadsheet can be used ! in your home for many interesting and, useful projects. Your family checkbook balancing is a good example. Most people Use the following procedures: have a checking account, and many families have difficulty balancing it every month, so we'll show how your checkbook could be handled on an electronic spreadsheet. This example is intended to suggest just one of the many ways you Jack and Sue's First National Checking can put it to work at home as well as at the office.

This program can simplify the drudgery that sometimes accompanies the monthly balancing task. It uses formulas to add or subtract the amounts you enter for checks and deposits, and to calculate your correct bank balance. If your mate is sloppy with math, this could be the answer to your problems. This example is complete and can be followed as is, without having to make up any complicated formulas; just type it into your computer and begin using it right away.

After familiarizing yourself with the **ELITE*CALC** system, begin setting up the HEADINGS for the checkbook. For example:

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entry MTE	C HESTAGRATION	DECK	DECE	DE.	 MIK	I HINGS	J DAME STATEMENT

 In the first row, type whatever title you would like to give the worksheet,

Acct.

2. In the next rows, type in the headings, as shown, or modify them to fit your own special needs. Use the appropriate commands to accomplish the format shown.

Set up the formulas as shown;

Cell H9: Formula = H8-E9+G9 (This calculates the Bank Balance after the lst check).

Cells HIØ thru H99;

REPLICATE Range H9 (Enter> REPLICATE To HIØ:H99 (Enter);

(This copies the formula in cell H9 to the cells below it, so the Bank Balance will be computed for each checkbook

Cell I9: Formula = (G9-E9)*F9

Cells ILØ thru 199:

REPLICATE Range 19 (Enter)

REPLICATE To IIG:199 (Enter) (Enter) (This copies the formula in cell 19 to the cells below it).

Cell J9: Formula = H8+19 Cell JlØ: Formula = J9+IlØ

Cells Jll thru J99: REPLICATE Range JLØ <Enter> REPLICATE To J11:J99 <Enter> <Enter> (This creates the formulas for comparing your checkbook balance with the Bank Statement).

Now that you have the framework set up, try putting some information in it.

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/27/83	SEAMS	ROBINCK	321	127.14	Ģ.		734.23	
/21/13	HORSE IS	ETHERE III.	37.1	385,50			376.73	
/20/03	POWER	STILLITY CO.	334	14.2	5		284.46	
/24/83	PATRICK.	ENCH GARAGE	#It	227, 81	Ļ		34.47	
especit.	MEE	BLT PARENCE	İ			4000 444	339,45	
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Type in your beginning bank balance in cell H8. Then type in your checks and deposits, one row at a time. As you input each amount, the Bank Balance will be printed for you. Use your existing checking account information so you can compare the totals as you go. Do not put anything in the "Chk.Off" column at this time.

Now let's assume that you have just received your July bank statement and it says you have \$411.58 as your balance and that all your checks have cleared the bank, except the \$86.25 one to Power Utility Co., and also that they charged you \$6.50 for July bank charges.

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SPECIAL OFFERS From Star-Kits

Christmas Sale (Until December 24, 1983)

STAR-DOS 64

Reduced from \$74.90 to \$49.90. This is the same price as the standard 16/32K version. Here is your chance to get this extraordinary Disk Operating System for the Color Computer at a great price.

SPELL 'N FIX

Reduced from \$69.29 to \$59.29 for the CoCo disk or cassette version, and from \$178.58 to \$125 for the Flex disk version.

HUMBUG-64

Reduced from \$59.95 to \$49.95. This version is specially configured for 64K disk systems using either Flex or STAR-DOS.

REBATE

Buy your Star-Kits software from a dealer, and get an extra savings by sending us your registration form and a copy of your sales slip or invoice. The rebate is \$10 on software priced over \$50, and \$5 for software under \$50. The rebate is in effect until December 24, 1983.

ILLEGITIMACY PROGRAM

If you have an illegitimate (ahem . . . pirated) copy of a Star-Kits program, we offer you an amnesty as part of our filegitimacy Program. Send us (a) a working copy of the program, (b) details on where and from whom you got it (with adequate identification of the source), and (c) 25% of the current list price, and we will send you (a) the latest up-to-date copy of the program, (b) a complete and up-to-date manual, and (c) a sales slip welcoming you to the world of happy Star-Kits customers. A small price to pay for a clear conscience?

MC-10 SPECIAL

To celebrate Star-Kits' being first with MC-10 software, here's our MC-10 Triple-Pak: MC-10 HUMBUG (normally \$29.95), MC-10 REMOTERM (normally \$19.95), and MC-10 COMMTERM (a brand new terminal communications program which sells separately for \$19.95), a total value of \$69.85, all for a special price of just \$55.

STAR — KITS

P.O. BOX 209 - J MT. KISCO, N.Y. 10549 (914) 241-0287

Just as you probably do on your check stubs, check off all the items that the bank included on its statement. Do this by typing a "l" in the "Chk.Off" column on the row for each item. This tells the computer which items the bank has received. Don't forget to check the "bank charge" also.

Now you should see numbers appear in column "J". If the last number agrees with the bank's total, your check is balanced. If it does not, it should be a fairly simple job to check your ENTRIES against the bank's figures and find out who made the mistake.

You may have wondered what the "hidden" column is for. It is used to hold an intermediate calculated value that you don't need to see. Therefore, it is "hidden" from the computer's screen and from the printer, but you can "unhide" it at any time you wish. Notice that the hidden column "I" shows in the first Heading example, but is missing from the others. This is done with the "H" command:

> H(ide) C(olumn) I <enter> [using only four keystrokes.]

The GRAPHICS command (G) allows you to make bar charts using any list of numbers. The BANK BALANCE PROFILE example shown (above) uses the Graphics Display to show the changing pattern of the balance in the bank. This was done by formatting the cells to create graph bars by labeling the cells with a "G", while in the "Format" mode. The following formula was used for PROFILE:= H8 / 40, and then it was replicated to the other cells. The "divided by 40" part of the formula is necessary to reduce the length of the graph bars. Each bar would be one asterisk long for each dollar in the account otherwise. \$963.25 divided by 40 equals 24, so the first bar is 24 asterisks long.

To summarize this review, I'd like to say again that ELITE CALC is a great buy as an electronic spreadsheet for the Color Computer and I would recommend it to all "CoConuts". Reviewed by:

Jack Lane Chief Engineer Williams Engineering, Inc. Atlanta, Ga.

--- EDITORS NOTE: ---

Due to the noted problem, we sent a copy of this review to Elite Software for their comments. The following reply was received from John Waclo, Pres.

It ALSO includes some EXCELLENT comments on their "Program Design Philosophy", which I think you will find interesting. We have offered ALL of the regular Color Micro Journal Advertisers space to discuss THEIR Products along this same line; why they chose to design their Product the way they did, what were the trade-offs, what type of CoCo User is the Product for, etc. We feel that this will provide YOU, the reader, with a better understanding of the problems involved in designing a product for the "mass market", and more information about the products that the advertiser just can't afford to pay for in the Advertisement.

--- RIN -

ELITE Software comments...

We were pleased to read that, ELITE*CALC well worth found The response from our recommending. also many users bas been very ELITE*CALC is finding enthusiasticapplications many, and varied, user throughout the entire world.

Before we respond to Mr. Lane's more specific comments, it might be helpful for the reader to understand our design philosophy. overall program First, we wanted ELITE*CALC to powerful, very powerful. With a large of powerful commands, variety ELITE*CALC would have enough flexibilty to successfully take-on many different Second, we wanted user applications. to provide the user with a maximum of This would worksheet storage space. ELITE*CALC find insure that would business use as well as home use applications. Finally, the presecution speed had to be fast. program For successful user acceptance, regardless of application, performance speed was a must. The final version of ELITE*CALC which we released represents the best balance which we could achieve self-imposed meeting our program objectives.

Now that you know the total picture. let's take a closer look at some of the parts which Mr. Lane questioned:

Concerning formula display, Mr. Lane would have liked to display formulas continuously as the cursor moved. felt that would have cluttered

display. Particularly consider that we allow formulas up 255 characters in length. We chose have a more graphicly clean display by showing the formula via the Edit command; where it could be quickly modified if necessary.

Concerning cell formating, Wr. Lane of. aome kind prefered for the user. format-status-review ELITE*CALC provides the user with 15 different cell format options that can be used in any combination. We felt, to display this information for a cell, We felt, or group of cells, would have required too much precious program memory. Our approach was much more direct. user didn't like the present display format for any cell (or group), just re-enter a new format. We made it quick and simple to do.

acreen eize, Mr. Lane Concerning prefered a 51x24 vs the 32x16 which we selected. We had a lot of discussion concerning screen size. If the higher resolution screen (51x24) were used, more RAM was required for screen more RAM was required display area. If we took that RAM from worksheet space the program would not be as desirable for large worksheet users. If we took the needed RAW from program space, the overall program would not have been as powerful. We could have only put portions of the program in memory at any given time, and used disk calls when they were needed. This would have slowed program speed, and what about tape users? whole thing was like a ballon. If you squeezed one place, it got bigger

STAR-KIBBITS

Welcome to the ninth of my monthly chats. To begin with, a short program and two requests.

When you do a BACKUP on a disk system, the computer is supposed to make an exact copy of a disk. Have you ever condered whether the copy is really identical to the original? Here is a short progress in Basic which allows you to compare

two distor (it is written for two drives): 18 GLEAR 2006 20 FOR T=O TO 34 : FOR S=1 TO 18 30 DSKIS O,T,S,A\$,B\$ 40 DSK# 1,T,S,C1,D\$ 50 II A\$=C\$ AND B\$=D\$ THEN 70 60 PRINT "DIFFERENCE ON", T.S.

70 NEXT S: NEXT T

This program consists of two loops which repeat for tracks 0 through 34, and sectors 2 through 18 of each track. Lines 30 and 40 read the corresponding sectors from drives 0 and 1, and line 60 prints the track and sector number for those sectors which are different on the two disks. You may find it very useful.

OK, now here's the first request. I'd like you to help me with a simple test. Initialize two disks with the DSKINI command, and then BACKUP one of them to the other. Now use the above program to check whether they are really identical, and let me know, I have an ulterior motive — I have run this test on three different computers (including different disk controllers and different drives). On two of them I got identical errors on sector 13 of tracks 5, 13, 17, 23, and 29. I'm curious to see whether anyone else has the same problem.

TAX DEDUCTION?

New for the second request. Do you have any Color Computer hardware or software which you would like to donate to a non-profit school? In the last few years, Star Kits has donated six Color Computers, as well as several printers, disk drives and cassette recorders, to local schools for computer education. If you have any CoCo equipment or software (such as a color computer, or disk system, or Line Printer VII, or anything else which you no longer need), or else if you just leef up to making a tax-deductible contribution of equipment or cash, we'd like to encourage you to do so. Send to the St. Francis School, 12 Green Street, Mt. Kisco NY 10549. ŞALEI

Christmas is slowly approaching, and with it the time for the traditional holiday sales. The following items will be offered at special sale prices until December 24th, 1983:

STAR DOS 64 is reduced from \$74.90 to \$49.90, the same price as the standard 16/32K STAR-DQS. Actually, for the \$49.90 price you get both versions.

SPELL 'N FIX is reduced from \$69.29 to \$59.29 for the CoCo. disk or cassette version, and from \$178.58 to \$125 for the Flex. disk corsion.

HUMBUG-64, the 64K version for Flex or STAR DOS is reduced from \$59.95 to \$49.95.

Add this to the relate we approunced last month, and you can get Star Kits polyware at really bargain prices.

To close, a neat definition (from The Devil's DP Dictionary by Stan Kelly Bootle) of Gershwin's Law: "It ain't necessarily

SPELL 'N FIX Regardless of whose text processor you use, let SPELL 'N FIX find and for your spelling and typing mistakes. It reads text faster thin's you can, and spots and corrects errors even experienced prophreaders miss. It is compatible with all Color Computer text processors, \$69.29 in the Radio Shack disk or cassette vehicle \$178.58 in the Flex version. (20,000 word dictionary is standard; optional 75,000 word Super Dictionary costs \$50 additional.)

HUMBUG - THE SUPER MONITOR

A complete monitor and debugging system which lets you input programs and data into memory, list memory contents, insert multiple breakpoints, single step, test, checksum, and compare memory contents, find data in memory, start and stop programs, upload and download, save to tape, connect the Color Computer to a terminal, printer, or remote computer, and more. HUMBUG on disk or cassette costs just \$39.95, special 64K version for FLEX or STAR DOS 64 costs \$59.95, MC-10 version \$29.95.

STAR-DOS

A Disk Operating System specially designed for the Color Computer, STAR-DOS is fully compatible with your present Color Computer disk format — it reads disks written by Extended Disk Basic and vice vents. STAR-DOS for 16K or 32K systems costs \$49.90; STAR-DOS 64 for 64K systems costs \$74.90.

STAR FLEX

The best implementation of FLEX for the Color Computer. Complete with all utilities, text editor, macro assembler, and HUMBLIG debug monitor, \$250.00

ALL IN ONE - Editor Etc.

Three programs in one — a full function Editor, a Text Processer and a Mailing List/Label program. All this for just \$50. Requires STAR-DOS and 32K, or STAR-DOS 64, or FLEX, specify which.

DBLS for Data Bases

DBLS stands for Data Base Lookup System. A super-fast system for searching for a selected record in a sequential disk file. Suppli-with SPELL 'N FDX's 20,000 word dictionary as a sample data file. lets you look up the spelling of any word in under FOUR seconds. Priced at \$29.96. Requires STAR-DOS.

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somewhere else. We feel that our final decision for a display of 32x16 was the best balance when you give equal consideration to program power, power, program workseet size, and execution speed.

2990

Finally, it's difficult to comment on "lock-up" Mr. Lame's software "lock-up" situation. While we are presently checking our out-of-memory sense routine, our users have informed us of these "hardware" influenced conditions. ELITE*CALC must execute from a cold-start condition. Today's market is full of software that does not properly "clear" the machine when you exit. Londing and executing ELITE*CALC under these conditions will cause undefined resulte. Also, we have identified two 64K "loader" programs, that do not properly initialize Basic. that do not properly initialize Basic. This will also cause probleme for ELITE*CALC. In addition, something is not correct with Mr. Lane's hardware start-up sequence. He indicates that he had 20,677 bytes available worksheet apace on a 64K machine. This is not correct. A properly loaded 64% machine will have over 28,000 bytes available for worksbeet storage. Clearly, for some reason, ELITE*CALC believed it was in a 32K machine. In any case, Mr. Lane followed good operating practice by making frequent saves of his worksheet. It is interesting to note, that had he been in a full 64K mode, ELITE*CALC would probably have handled his complicated workeheet with sophisticated formulas.

In summary, I think we would all agree that ELITE*CALC provides extensive user power, šizable worksbeet space, and efficient execution speed. I personally want to thank Mr. Lane for bis comments. I thought they were very fair. I would also like to thank Mr. Robert L. Nay, Editor of COLOR MICRO JOURNAL, for providing this reviewer/supplier forum. Everybody will benefit from this kind of

> John Waclo ELITE Software Box 11224 Pittsburgh, PA 15238

RAMSCAN

A Diagnostic Test for the Color Computer

RAMSCAN is a diagnostic routine written for the Color Computer, and will operate on any size system. RAMSCAN is designed. to test each bit in every byte of RAM (memory).

I originally wrote RAMSCAN in December 1982 to help me check the memory in my newly expanded 32K RAM computer. RAMSCAN is easy to understand, because it is one of my early Assembly Language programs and does not contain difficult instruction codes; therefore, it may provide some insight for new Assembly Language programmers.

It has two primary purposes. First; to test from #1024 (\$400 - the Screen beginning address) to the last byte of your machine's RAM. Second; once the last byte of RAM is known from the first test, the information is poked into line 750 from BASIC, which puts the program into a loop that should continue to run indefinitely if desired.

The reason for the second test (loop) is that it tests not only the RAM again and again, but it also exercises the 6809E Microprocessor; therefore, any failure that occurs at a later time should be due to a hardware malfunction (usually

3680	ØE	0400	00130	BASE	LDX	#1024	SCREEN
	10FF		00140		STS	STACK	SAVE RETURN
36B7		84	00150	STRIBT .		, X	LOAD BYTE
3699	B 7	3738	00160			TEMPST	SAVE OLD BYTE FOR RESTORATION
369C	66	00	00170		LDA	#0	
SABE	Ca	00	00160		LDB	#0	and the same
36C0	A7	B4	00190	TSTLOP	STA	, ×	STORE TO TEST
3 6 C2	A6	84	00200		LDA	, X	LOAD TEST
36C4	227	3739	00210		STA	THPBTE	STORE TO COMPARE TEST
36C7	F1	3739	00220		CMPB	TMPBTE	COMPARE TEST
36CA	26	ÓĎ	00230		BNE	FAIL	FAIL, IF NOT EQUAL
36CC		FF	00240		CMPA	#255	BYTE TESTED?
36CE		1A	00250		BEG	DSPLOC	YES IF EQUAL
36D0		A.F.	00260		INCA		INCREASE BITS
36D1			00270		INCB		INCREASE TO COMPARE
36D2		EC	00280		BRA	TETL OP	CHARLES THE LANGE
				SKPPRE			END OF PROGRAM
36D4		3740	00300	SKELVO	BRA	STRTBT	
36D7		DE					
36D9		FF		FAIL	LDA	#255	LOAD RED CURSER
29DB		0400	00320		LDX	#1024	LOAD SCREEN ADDRESS
360E		84	00220		STA	X	STORE ON SCREEN
	10FE	373A	00340		LD\$	STACK	LOAD RETURN ADDRESS
36E4	39		00320		RTS		RETURN
36E5	BE	0400	00360	RESTRE	LDX	#1024	LOAD SCREEN
36E8	20	CD	00370		BRA	STRIBT	RESTART
	10BE	3736	00380	DSPLOC	LDY	SCREEN	SCREEN ADDRESS
	1F		00390		TFR	X,D	
36F0		89	00400		TER	A,B	
36F2		3723	00410				SHIFT M/S NIBBLE, PUT ON SCREEN
36F5		98	00420			B.A	
36F7		OF	00430			*15	CLEAR M/S NIBBLE
36F9		3727	00440		JSR	PUTLSN	PUT L/S NIBBLE OF M/S BYTE ON 8
		3/4/	00770		DON	FOILSH	POT LIB NIEBEL OF THE BITE OF
CREEN		A 4	00480		1.55	v	
36FC		84	00450		LDD	, X	
36FE		98	00460		TER	B, A	
3700		3723	00470		JSR	SFTNIB	SHIFT&PUT M/S NIBBLE OF L/S BYT
	SCREE						-7
3703		9 6	00480			B, A	
3705		0F	00490				CLEAR M/S NIBBLE
3707	BD	3727	00500		JSR	PUTLSN	PUT L/S NIBBLE OF L/S BYTE ON S
CREEK	N						
370A	B6	3738	00510		ĻĐA)	TEMPST	LOAD OLD BYTE
370D	A7	84	00520		STA	, X	RESTORE OLD BYTE
370F	30	01	00530		LEAX	1, X	ADVANCE BYTE
3711		373C	00540		STX		SAVE TESTED BYTE FOR SAFETY
3714		3680	00550		CMPX	#BASE	START OF PROGRAM
	1027		00560		LBEG	SKPPR6	SKIP PROGRAM
371B		373E	00570		CMPX	END	POKE END OF YOUR RAM HERE AND I
		TAY IN LO			CHILA	END	LOVE BIR OL LOOK WAI LIGHT HIS T
F 医研 371年			00580		BEG	RESTRT	RESTART
3720		C5 FF94	00590		LBRA	STRIBT	GOTO MAIN LOOP
3723		FF74		SETNIB		SIDABI	SHIFT BYTE
3724			00610	Shi Harry	LSRA		20121 1 20112
3725			00620		LSRA		
			00620		LSRA		
3726						40	IF LESS OR EQUAL PUT NUMBER ON
3727		09	00840	PUTLSN	CMPA	#9	IF LESS UK EWUAL FUT MURBER UM
SCREI							
37 29		04	00650		BHI	CONVLT	IF HIGHER PUT LETTER ON SCREEN
372B		70	00660		ADDA	#112	CONVERT TO ASCII
372D	20	02	00570		BRA	HPS 1	,
372F	98	37	00480	CONVLT	ADDA	#55	CONVERT TO LETTER
3731	A7	A4	00590	MPS1	STA	, Y	PUT ON SCREEN
3733		21	00700		LEAY	1,Y	ADVANCE SCREEN ADDRESS
3735			00710		RTS		RETURN
3734		0465		SCREEN	FDB	1125	SCREEN ADDRESS
3738				TEMPST	RMB	1	STORE OLD BYTE
3739				TMPBTE	RMB	i	COMPARE
373A				STACK	RMB	2	
							EATI BYTE STOREN WERE
373C			00760		RMB	2	FAIL BYTE STORED HERE
373E			00770		RMB	2	END OF RAM POKE HERE
3740	12			LASTEN	NOP		END OF PROGRAM
		0000	00790		END		
0000	O TOT	AL ERRORS					

00100 * * * * RAMSCAN * * * *

COLIO # WRITTEN BY EMMETT M. LEWIS, CORPUS CHRISTI, TEXAS

14000

373E MP81 3731 BCREEN 3736 STACK 36BO END CONVLT 372F FAIL 3609 PUTLEN 3727 SETNIB 3723 STRTBT 3687 TMPBTE DSPLOC 36EA LASTEN 3740 RESTRT 36E5 BKPPRG 36D4 TEMPST 3738 TBTLOP 36C0

Software is going blitz at the most X is compared to END in line 570 and, if inconvenient times.

We put the program into a loop by poking locations 14142 (M.S.B.), 14143 (L.S.B.). The ending address you poke into END should be about one hundred bytes below RAM each time you run Test One.

For example, if you have a 16K machine, Test One should fail about \$3FFF, 16383 (usually less). So, to poke the ending address into END from BASIC (we poke 100 bytes less; \$3F93, or 16283) POKE

from heat buildup). This should allow 14142,63:POKE 14143,155. After the you to check your Computer if your program is executed (EXEC 14800) register

equal, the program restarts and remains

in the loop.

373A TEST

the ending address from BASIC into RAM One final word; when the program is executed, it tests the Display Screen Memory first. RAM is then restored, and the byte being tested is output to the the top (end) of RAM because the program screen in HEX. If, for some reason, you does not find the same byte to be end of wish to double check the failed byte, you may do so by peeking into TEST. From BASIC key in P=PEEK (14146): Pl=PEEK (14141): PRINT (P*256+P1). This will be the byte that failed the test.

By Emmett M. Lewis

Color Micro Iournal"

5900 Cassandra Smith Rd. *

Hixson, TN. 37343

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MICROWARE OS-9 2nd Annual Seminar

Microware Corporation, the developers of OS-9 held their second annual OS-9 Seminar in Des Moines, Iowa the 12th, 13th, 14th and 15th August '83. To report the entire affair in detail would probably take up this entire issue. So I will attempt to cover what I thought were the highlights and happenings that you might find interesting.

There were over 400 (estimate) users attending and a total of 23 exhibitors showing their OS-9 hardware and software. The exhibitors were

Motorola Positron Ltd. Ackerman Digital Inc. OS-9 Users Group JBM Group Inc. Forum 68 Gimix Inc. Tano Corp. Micro Intl. Microware Systems Corp. Specialty Electronics Candid Logic Smoke Signal Broadcasting FHL Great Plains Computers Matrix Corp. Computer Sys Consultants Applied Computer Tech. Computer Systems Center Hazelwood Computers Advanced Digital Tech. Creative Micro Systems Privac, Inc.

My wife Joyce and I arrived early Friday morning having decided to drive (930 miles) the night before as the weather was forecast to be too bad to fly our light plane to Des Moines. Needless to say it was clear as a bell all the way, oh well. Was met at the door of the Mariott Hotel by Richard Don of Gimix who was apparently looking out for all his 'chicks'. This was about 1:30 a.m. Friday morning. After exchanging some (can't remember what) I staggered off to bed after a straight 19 hours of driving. So ended day one.

Friday was sort of a hectic set up day for the exhibitors as the attendance was expected to be greater than originally anticipated. It was. I was personally surprised at the intensity and quality of the hardware and software shown. OS-9 has sorta 'crept' up on the S50 Bus community. Yes, it has been here for over 4 years, but we, or at least I, did not actually comprehend just how solid the growth of OS-9 has been. In my conversations with many others, I gather that they are also somewhat surprised by the depth and penetration made by OS-9 in the past few years. OS-9 has injected new vigor and interest in the 6809 and Standard S50 Bus computers in general, and that can only speak well to the future.

Friday night, the 12th, we gathered for a welcoming banquet at the hotel. The guest speaker was no less than the governor of the state of Iowa, Jerry Branstad. Now, I have been to a lot of computer conventions and such, but this is the first time that I can remember that the governor came, with his wife, and addressed the group. Fact is he

indicated that he and Ken Kaplan have a lot in common, they both are expecting new additions to the family shortly.

I would imagine that by the time this is delivered to you, young Master Aaron Kaplan will have arrived. I sorta stood around all weekend, with a stock of my best cigars, waiting for his arrival. I figured Ken might need some help from an experienced 'cigar hander outer'. But as of this date, nearly a week later, Aaron has refused to cooperate. He is past due and I think I know the reason; he just wants to make sure that Dad and all the others down at Microware have all the major bugs out of OS-9. Well, I can tell you son, from what I saw, have no fear, things sure seemed to be running smooth, and I talked to a lot of very satisfied users from all over the world.

Also during the banquet Ken Kaplan rose and announced that there were some awards to be presented. The following is the 'scrolls' from which the words of praise and predictions were delivered to all. A nice trophy was presented to all honored by this prestigious event. I personally was deeply humbled to realize that my goal and burning desire of enlightenment was finally being acknowledged for what it actually has been these long years. I know that Columbus (the one from across the water and not the one in Ohio, Georgia, etc.) now sleeps more securely. 6 out of 10 ain't bad!

THE ALEXANDER GRAHAM BELL AWARD Richard Don, Gimin, Inc.

Besides being a prominent computer manufacturer, Mr. Don is an outstanding spokesman to our industry. Outstanding indeed! His unique method of direct communication with a wide audience every night by telephone is truly awesome. Very few Americans appreciate the fact that we would not have the world's finest telephone system if Richard Don were not around to pay for it. Even fewer people are aware of the fact that the upcoming breakup of ATAT is the direct result of one weekend last winter when Richard had laryngitis. We are confident that Mr. Don's tireless efforts will someday help us achieve the goal of replacing every audio telephone set in the country with auto-answer modems. Mr. Don, we salute you!

THE CRAY-2 AWARD Ric Hammond, Smoke Signal Broadcasting

It would have never occurred to us sleepy backwater folks that 06-9 is the ideal operating system for the CRAY-2 supercomputer. Had it not been for Mr. Hammond's suggestion and encouragement, Microware probably would never have done the CRAY-2 version of OS-9. Even though he didn't really think of it until Smoke Signal's marketing manager, Jim Allday, had already sold three copies, we feel he still deserves this award. By the way, those of you who have Cray 2s at home can get your own copy as soon as Smoke Signal finishes up the joystick drivers. Mr. Hammond, we salute you!

THE BARTER ECONOMICS AWARD Mr. Pete Prossen, Creatise Micro Systems

Pete Prossen is one of our favorite people. His company makes top notch Exorbus systems and boards and he was one of the very first 6809 manufacturers to take a chance on an unproven operating system called OS-While his company and products are quite well-known, one little known fact about Pete is that he also owns an avocado grove. We really like avocados, but, unfortunately, they are not indigenous to this area. So we made an interesting deal - we ship software to Pete, and he ships avocados back to us. This is a classic example of an advanced economic concept called "Barter Trade", and we think its great. The only real problem with it is that we have not been able to get the tax collector to accept vegetables yet. In case some of you who are our customers are thinking of similar schemes, we must warn you that we already have plenty of disks, roms, telephones, computers, automobiles, assorted control systems, software, cotton, corn, rice, and soybeans. However, we are still in need of gold, silver, platinum, diamonds, rare coins, or original 15th century old masters. For being a pioneer in barter economics, Mr. Prossen, ws salute you!

THE INTERNATIONAL GEOGRAPHIC AWARD Mr. Don Williams, '68' Micro Journal

A recent survey indicated that over 6 out of 10 6809 programmers now believe the earth is indeed round. For this amazing feat of mass education we must give full credit to Mr. Don Williams, Publisher of 68 Micro Journal Magazine. Since its inception, the cover of every issue of 68 Micro Journal has had a full color satellite photograph of the planet Earth which clearly exhibits its round shape. We also wish to refute the vicious rumor that the reason Mr. Williams has run the same cover for the last five years is that he got a hell of a deal on two and a half million unused covers for the now-defunct magazine, "Albanian Space Research Digest". But we do not know if there is any truth behind the rumor that over the next five years 68 Micro Journal will switch its cover to a photo of a microprocessor chip in order to teach programmers that integrated circuits are rectangular objects. Mr. Williams, we salute you!

THE SYSTEM SORCERY AMARD Mr. Jack DeFrial, Mivenced Digital Technology

Mr DeFrial is a prophet of a magic box called a real-time emulator system. This ingenious device has contributed greatly to the mental health of 6809 programmers by regularly delivering irrefutable evidence that most bugs are really hardware problems. Upon offering the appropriate incantations to this magic box, it will transform an

TEN MOST-ASKED QUESTIONS about DYNACALC***

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- 8. Is there a version of DYNACALC for MY system? Probably. You need a 6809 computer (32k minimum) with FLEXTM, UniFLEXTM, or OS-9TM operating system. You also need a decent crt terminal, one with at least 80 characters per line, and direct cursor addressing. If your terminal isn't smart enough for DYNACALC, you probably need a new one anyway. The UniFLEX and OS-9 versions of DYNACALC allow you to mix different brands of terminal on the same system. There's also a special version of DYNACALC for Color Computers equipped with FLEX (Frank Hogg or Data-Comp versions).
- 9. How much does DYNACALC cost? The FLEX versions are just \$200 per copy; UniFLEX version \$395; OS-9 version (works with LEVEL ONE or LEVEL TWO) \$250. Orders outside North America add \$7 per copy for postage. We encourage dealers to handle DYNACALC, since it's a product that sells instantly upon demonstration. Call or write on your company letterhead for more information.
- 10. Where do I order DYNACALC?.

 See your local DYNACALC dealer, or order directly from CSC at the address below. We accept telephone orders from 10 am to 6 pm, Monday through Friday. Call us at 314-576-5020. Your VISA or MasterCard is welcome. Please specify diskette size for FLEX or OS-9 versions. Software serial number is required for the UniFLEX version.

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ordinary dumb terminal into a crystal ball which allows one to peek into the mysterious time dimension of microsecond and nanoseconds. It is within this strange world that mischievous logic circuits play havoc upon even the most highly structured code. This is something we programmers have suspected for a long time, but were unable to prove, until this amazing device came along. Mr DeFrial, we salute you!

THE STIMULATION IN ADVISTISING AWARD Prank Hogg, Frank Hogg Laboratories

Mr. Hogg is well known as a major and innovative 6809 software distributor. By running his nowfamous ad of an attractive young lady clad only in a nightgown, Frank Hogg Laboratories has advanced the art of software marketing from its primitive tasteful status quo to the more stimulating and sophisticated techniques employed by big Madison Avenue agencies to sell products such as razor blades, motorcycles, waterbeds, and lite beer. We understand that after this ad hit the streets the phone at Frank Hogg Labs rang off the hook for weeks. but unfortunately most callers wanted the lady's phone number instead of software. But don't worry Frank, if it works for Gillette it will work for you too. Unfortunately, Mr. Hogg is not here to accept his awards as he has a date with you-know-who, so accepting the award in his place will

Saturday the 13th started off at 8:00 a.m. with an audio-visual presentation by Microware. This was followed by indepth classes and demonstrations of Microware software and languages running under the 05-9 disk system. The entire crew from Microware, including Ken Kaplan, attended these sessions and fielded any and all questions, suggestions, and comments from the large group gathered. At times several hundred would be gathered, and each one who desired to be heard was acknowledged. The exchanges were were both informative and constructive to all who attended and expressed their impressions to me.

The topics covered during that day were, of course, 05-9 and Basic@9. Additionally an OS-9 roundtable, a free. discussion period lasting over 2 hours, was heavy in attendance with all getting a chance to say their piece. I attended this session and do not remember any serious negative comments, from any participant. Frankly I was a bit surprised; I have seldom seen this close a working relation between vendor and users before. Everyone had a chance to 'let the hair down', but I saw little if any dandruff. This speaks well for the apparent excellent relationship between Microware and their customers.

The days sessions ended (but not the days activities) with a general language roundtable, again attended by almost all of the Microware crew, including Ken. At this time Microware introduced James McCosh, author of Microware's 'C', and Keith Ashman, who discussed the powerful development language 'Sage'. Both had come from England to attend and field questions and comments concerning their products. By this time the prearranged schedule had 'gone-to-pot' as the OS-9

Saturday the 13th started off at 8:00 Users Group who had intended to meet at a.m. with an audio-visual presentation by 5:30 p.m. finally got started sometime Microware. This was followed by indepth after 8:00 p.m., if my memory serves me classes and demonstrations of Microware correct.

Saturday evening the 68 Micro Journal banquet got underway about 5:30 or so. This was a wonderful opportunity for me to say thanks to many there who have supported 68 Micro Journal over the years. I had no intention of giving a pep or sales pitch, just a chance for a lot of old friends to get together. Over 75 gathered, and as we were getting started, Ken Kaplan and Richard Don (Gimix) 'captured' the groups attention by pounding silverware on glasses (seems like it is hard sometimes to get the attention of a group of Standard S50 Busers). Well, to say the VERY LEAST I got a real SURPRISE. There I sat, patting myself on the back for not imposing a 'pitch' on my friends, when these two took control. "What", I thought, "some folks just never let an opportunity pass." About that time the doors opened and in walked a serving crew with a candle lit birthday cake. Ken and Richard led the crowd in singing "Happy Birthday - Dear Don". All I can ever say is thanks Jeanne, Ken, Arlene, Richard and all the others who were in on this well kept secret! The 13th was my birthday, won't say how many. For those of you who know me, it was a rare moment of speechlessness. I was really dumbfounded!! I want to thank everyone for making that one of the nicest moments in my entire life. Despite the fact that not one voice in the crowd seemed to be capable of carrying a tune, yet how sweet it was.

Saturday night extended well into the morning as Joyce and I attended the hospitality suites of MICROWARE, GIMIX, SMOKE SIGNAL BROADCASTING, ACKERMAN DIGITAL and ADVANCED TECHNOLOGY. Regretfully we missed the HAZELWOOD hospitality suite as they were gone to some of others when we called. So went the day.

Sunday started a little late with a brunch hosted by Microware. Afterwards the conference room filled to near capacity as Microware introduced their new OS-9/68000. From the response voiced by potential license prospects and users, the future looks bright. Especially for those who have existing hardware and OS-9 software presently running. It appears that the 'carryover' from 6809 OS-9 and 68000 OS-9 will be about as painless as it could be The 'basic language' (no pun intended) will be 'C'. However, it appears that most all the other high level language source programs will be portable, including Basic 9. That means that the present users do not have to hold off their applications software development, they will be able to port it across to the 68000. To me that is one of the more important aspects facing the user who wishes to upgrade. The time and expense can be fatal, in some cases, otherwise.

Following this session, additional discussions were held on the new OS-9 'C'. The 'C' language seems to be making fast inroads in the 6809 community. I suspect it will be the predominant language a couple years hence.

Additional new Microware OS-9 software was presented, including a new Color Micro Journal







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Tape Information Management System

A user-oriented, easy to use personal database management system for the TRS-80" Color Computer with these outstanding features:

- keeps files of programs, names, addresses, birthdays, recipes, class or club rosters, etc.
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- up to 8 user-definable fields
- ML sort (up to 3 fields), search and delete functions
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- * up to 230 characters per record

Price includes the database management system, full documentation including a reference guide and 1981 Bibliography of Color Computer articles.

Requires 16K Extended Basic, 32K recommended.

1982 TIMS Bibliography - \$9.95.



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The TIMSMAIL mailing list manager has most of the fine features of TIMS as well as these special mailing label features:

- user selected label formats
- continuous or single sheet
- designed for 80 column printer
- * 1, 2 or 3 labels wide
- + 2.5, 2.75, 3, 3.5 and 4 inch labels
- · select fields to print
- select records to print · fast ML search, sort (up to 3 fields) and delete routines

Requires BEK Extended Besit



Auto Run is a utility program for the TRS-80" Extended Basic Color Computer, it is used to

add convenience and professionalism to your autiware.

Auto Run will help you create your title acreen with the graphics editor. The graphics editor allows you to choose a background color and border style. Using the arrow keys and several other commands you can draw pictures, block letters and also include text.

Auto Run will generate a machine language loader program to preceed your program on

the tape. Then, to start up your program, simply type CLOADM to load in the Auto Run loader program, which will then automatically start itself up, display your little screen, load your program and then RUN or EXEC It. Also you may record a vocal or musical introduction preceeding your program. The Auto

Run loader will control the audio on/off. Basic programs can be set to load anywhere in memory above the PCLEAR 0 page.

Software authors: The Auto Run prefix may be appended to your software products. Price includes complete documentation and assembly source listing. Requires 16K Extended Basic.

Galactic Hangman

A great new twist to the popular educational word guessing game for the Color Computer. Large (700 words) and sophisticated vocabulary. Or enter your own words, your child's



Outstanding high resolution graphics. animation and sound effects. Price includes both 16K and 32K versions.

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- Title screen graphics aditor to create your own title screen
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Disk Version - \$24.95 Disk version with all 62 stories - \$49.95

A sensational and educational version of a popular party game for the TRS-80' Color Computer... For 1 to 10 players. Load a story into the computer. The players are saled to supply a noun, verb, part of body, calabrity, stc. which the program uses to complete the story. The story, which is displayed when all words are entered, will be hiterious.

Price includes Silly Syntax game, user guide and 2 stories. Requires IBK Extended Basic (32K for disk).

You can create your own stories or order story tapes from the selection below.

Each story tape is \$6.96.

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PREREADER \$19.95 Disk - \$24.95

Help your preschool age (3-5) child learn to read with this easy to use menu-driven program. Great high resolution graphics, colors and sound effects. Includes capital and small letters, numbers, shapes and colors, much more! Requires 32K Extended Basic and joyaticks.

STATGRAF \$24.95

Disk - \$29.95

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Later Sunday afternoon presentations were made on behalf of the 'SAGE Applications Generator System', CANDID LOGIC INC.'s, MICRO INTERNATIONAL, EUROMAK COMPUTER SYSTEMS, KEMTRONIX LTD, LEARNING VENTURES, UNISOFT (TMP) and Brian Capouch's programs and systems. This went on until the hall closed about 6:20 p.m.

Monday morning the Microware crew with many (few had departed) attending. Microware failed to meet head-on and reply to all questions, comments and times by users I talked to. They were bonds already established. both impressed and grateful that Microware took sufficient time to listen and respond in depth to all.

Monday afternoon was spent by all being invited to the Microware Works' for a tour of the facilities, which Microware will be vecating soon for much larger and newer quarters. As for the 'boss' and I we piled in the heap and headed home to the hills of Tennessee. The drive back was pleasant and enjoyable, despite the 19 hours of steady driving. All in all it was a very pleasant and educational four days.

OS-9 and Radio Shack

While we were at the Microware shindig, Tandy-Radio Shack released the official word (via mailed catalog) of the availability of Microware's OS-9 disk



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of the better 'how to' manuals on OS-9. that will be available soon-

reassembled and again individual Congratulations to Dale, Peter and all will reward us all. You will have a questions and problems were discussed the other incoming officers. Also our choice of more and better products. AAt no time did it ever appear that for their efforts this past year on better and less costly goods. Our behalf of the OS-9 Users Group. The market is no different. problems. This was commented on many the Users Group can only strengthen the enhance both 68 MICRO JOURNAL and COLOR

> the Microware S-9 disk system for their published, more than five years ago. products, speaks well of things to come. With nearly a half million of Color Computers out there, and all now capable that 68 MICRO JOURNAL will cater more to of running a full blown multi-user, multitasking disk system, literally blows the mind. The potential for the software and add-on market is counted in the millions, real spendable dollars that is. Like I way). There will be some duplication in said back when most everyone, including each publications, however, both will Radio Shack, was derating the Color Computer, it had potential that even the designers overlooked. Manufacturers and publishers alike, who just a few months ago were belittling the CoCo, now are to both markets, at reduced rates. madly scrambling to climb aboard. Microware picked a plump plum thereIII And we were telling you about the latent power just waiting to be exposed, since day one.

COLOR MICRO JOURNAL has received. Seems and quality. that our basic goals carry over to Color Micro Journal also. We never have pretended to be a 'slick'. Fact is we went from slick paper to a duller matted paper because too many complained about computer devices, than all the other community stand to gain; EVERYONE. magazines combined! And we intend to continue to lead. Maybe we won't have a we have so much to try to offer you that others joined, things improved. other magazines would just not mess wider choices and support. with, we print it. Knowing that it is valuable to many of you and if we didn't COLOR MICRO JOURNAL also.

I am convinced of this more strongly soon be a leading force in specialty forward to the future; together. publishing.

An important aspect is that many built-in limitations in the Color It comes complete, at this price, with Computer, but having invested time and editor, assembler and debugger. The precious dollars in a Color Computer and standard, full feature Microware Basic 9 OS-9 software, they will, by necessity, is also available for \$99.95. Dale want to upgrade to more expandable 6809 Puckett, newly elected president of the computers. That alone will expand the OS-9 Users Group, has written a very potential market of our present informative book on how to use Basic 29 advertisers many thousand fold, especially those catering to the OG-9 marketplace. Back when other publishers ignored the While on the subject of the OS-9 68XX market, we kept the faith, along Users Group, our very own Peter Dibble with all of you. As the community was elected vice-president. prospers, in the future, the spillower thanks to Brian Capouch and his officers large support and user base makes for And our close cooperation between Microware and experience and qualifications will MICRO JOURNAL. Which means that with time we can serve you better. And that The decision by Radio Shack to adopt has been my goal since we first

> As the months pass you will find the Standard S50 Bus and the growing 68000 users base. COLOR MICRO JOURNAL will direct it's efforts more to the other 6809 systems (more are on the directs it's efforts to a different readership. Readers and advertisers alike will be offered, in the near future, combined incentives to avail themselves

We believe that we return more of our gross income, percentage wise, to our publications, than any other publishing endeavor. In the past ours has been a small market, however, I Also while at the seminar I was expect things to change. As we grow, so gratified with the response our new will our size and content; both in volume

I sincerely believe that the adoption of Microware's OS-9 disk system and languages is a major event of tremendous proportions in the 6809 community. Ours the glare from slick paper while has been a QUALITY base since the attempting to copy one of the many beginning, as compared to what the source listings from 68 Micro Journal. others have offered. Sometimes we have Also we have published more articles, fallen a little behind but we always come words or what have you, concerning the back. This is another of those times Standard S50 Bus and the 68XX series of and EVERY one connected with the 6809

From the very earliest days when lot of cartoons, space wasting headers there was primarily Southwest Technical and all the other plays that publishers Products and TSC to look to for support, and editors do to grab your attention. we survived; mainly because they were Never had them and never will (as the ad there and supplying state-of-the-art What we have had and will products. Without that support we would continue to have is gut level information not have survived as a group. We are that allows you, our readers, to gain the where we are today because they most from your 690% computer. At times delivered. We all owe them a large debt some of it is small or hard to read, but of gratitude. As the years passed and

I have not forgotten, and I sincerely print it - no one would. Far better hope that you won't either. Our choices than 'file 13'. So will be the format of are expanding and that is a sure sign of progress and prosperity.

I hope that all of us, readers and after our initial release of issue one advertisers alike will prosper as we more this past month. We reached more than define our market aims, in the coming 30,000 - RIGHT - more than 30,000 months. We, 68 MICRO JOURNAL and COLOR readers with the first issue. And now MICRO JOURNAL, as well as S.E. Media and with our background and firm footing in Data-Comp, sincerely THANK YOU for all the 6809 world, COLOR MICRO JOURNAL will the support in the past, and look

Color Computer 64K RAM Mod

When I first became aware of the hidden built in features of the Radio Shack Color computer, it was of interest that the computer could be up graded with 64K memory at a minimum expense. At first 1 could see no reason for doing this 1 asked the obvious questions like Ħ became a réal possibility.

A few months ago I heard through the rumor mill that the FLEX disk operation system will be available for the TRS-80C but it will require 64K to make it operational. This was the final straw and I knew that I must upgrade. Earlier this year two articles appeared in two magazines. After reading two articles in the 68 Micro Journal (ref 1) and 80 Microcomputing (ref 2) it became very obvious that updating the TRS-80C to 64K was possible, but the two articles painted a rather confused picture of what had to be done. Each article presented a part of the overall picture and I decided to use their ideas but make my own slight twist-

I decided to make the mod as clean as possible with all wiring below the PC board. This means the mod cannot be backed out. After all who would want to do that. If your computer has 64K and has less power drain why would you want to back out the change? My change requires the cutting of lands and involves a little more work than the other magazine articles. But the net result is cleaner, and looks more professional.

TRS-80C PC BOARD LEVEL

The first decision process is to see what level your machine is. This is very simple. You could look for the part number on the PC board and see if it has a suffix letter. But the easiest method is to look to see how many shorting bers are on the PC board. If you have only two your computer is pre E revision release. If you have seven it is the E revision if your board is a E revision you will have to swap some jumpers and make only the revision which desalects the ROMS. If your board is a non E revision make all the following steps. I included a diagram of the jumpers on a E revision board to allow for jumpering (Fig 1). It is also advisable to remove the bypass caps *(8 ea.) If you plan to modify an E level board.

I. VOLTAGES ON THE RAMS

The first step is to remove the 4K or 16K rams from your PC board. Next remove the PC board and the ground shield on the bottom of the board. Now obtain a sharp knife and a soldering from You will also need a 74(\$138 IC a 33 ohm resistor and a socket. If you do not have BASIC revision 1.1 don't start on the mod. Obtain one, it is required! The first modification removes some excess caps and applies the correct voltages on the

This is accomplished by cutting lands and adding one jumper. Look at the Figure 2 for details. This diagram shows the differences between the 64K and 16K. RAM IC's. This modification will remove the plus 12 volts from pin 8 and place place 5 volts on pin 8. The wire land connected to pin 9 will be used to select the A7 address bit for the chip selection.

The land connected to pin 9 will be connected to the SAM 6883 IC.

On the top side of the board first cut out eight capacitors with sharp dikes *(G61, G31, G64, G35, G67, G48, G70 & G45). These IC were used to bypass the plus five volts.

Next cut the plus 5 and plus 12 volts lands and add a jumper. This will place the correct potential on the RAMS. If your 64K RAMS are the 3764 (OKI) then the minus five voit land should be cut going to pin 1 of the

if your RAMs require plus 5 voits on pin I add another Jumper-

2. ADDRESS A7 to 64K RAMS

Now you must make a basic decision. Do you want the mod to look professional, or do you want it to look sloppy. I'll describe the clean professional method. All wiring is under the PC board.

On the top side of the board connect a 33 chm resister to pin 35 of the 6883 IC. The simplest method is to solder directly to the IC pin. Extend the resistor lead with a short piece of small wire, approximately 30 gauge. From the bottom side of the board solder suck one cut end of a capacitor that was cut out. Solder the wire to the plated through hole in the PC board. With a ohm meter insure that pin 35 of the 6883 is really connected to pin 9 of the RAM IC's through a 35 chm resistor. Also insure that all caps have been removed.

3. MEMORY SIZE JUMPER .

You will next have to provide a jumper from one PIA to another will allow the BASIC ROM (Yer 1.1 only) to know that your pachine is really 32 or 64K.

On the rear side of the board add a jumper or small wire from pin 17 of U8 (6821) to pin 12 of U4

4. DESELECTION OF THE INTERNAL ROMS

If you wish to allow the upper 32K of the RAMS to be used it is necessary to allow the ROMS to be switched out of the computer by software. This is tricky and will require some special settware to take its place when you make the change. The FLEX disk operating system will do this. A schematic of this change is in Figure 3.

First remove IC 811 (74L5138) from the PC the needs 64K RAMS now evallable for less than \$10 each cut out the socket. This is necessary because pin 5 is shorted to ground under the IC. When this is done and the pins are cleaned up, cut the ground on the top side +12 of the board. Add another socket end a 7415138 and everything is normal. Next cut the grounds lends on pins 5 and 6 of U29 (741502). This will give you a free NOR gate on the 741502. Add three small wires from TP1 (R/W) to pin 5 of the 74LSO2 and Jumper pins 6 and 8 of the 74LSO2. Next run a wire from pin 4 of the 74LSO2 to pin 5 of the 74LS138 (UII). That the mod it sure isn't too difficult.

CHECKOUT

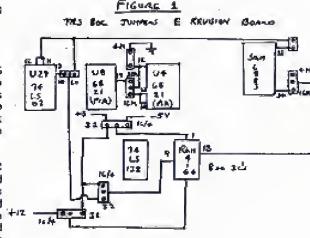
The last step is to make sure that everything was done correctly. Spend at least 15 min checking and re-checking all your connections. It could be costly if you blowout some very expensive ic's. Radio Shack will not repair the unit, they will charge you for a

Power up the unit when you get enough nerve, if It doesn't smoke and the familiar display is on the screen, type PRINT MEM. You should have approximately 24K or more RAM.

So good luck. If you migrate up to FLEX or OS9 you will have a very powerful computer as good as many expensive Z60 CPM systems.

I now have the FLEX DOS operating on a TRS 80C. The possibilities are endless. I have found that I can run all of my 6809 software which runs on my big system like Pescal, Text Processors, Basic Compilers and other programs. The TRS-80C has now joined the world of big computer. By the time this article is published the list price of a 4K TRS-80C should be \$299. Not bad for a small home computer. Add the 64 RAM chips and for less than \$400 you can have a 64K computer.

Ref I ~ 32K RAM For Free, 68 Micro Journal, February 1982, by: Frank Hogg Ref 2 - RAM Wars, 80 Microcomputing, March 1982, by: Shawn A. McClenatm



F16002 2 TRES BOC LAND HONFILLTIONS D REWINDS OF BALLIAR KEVISTOMS

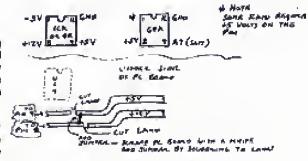


FIGURE 3 DREELACTION OF INTERNAL ROM'S, ALL



BY: Cleyton W. Abrams

LAYAL PE BOARDS



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Once installed, you will find XDMS applicable to a wide variety of uses. (You may even wonder why others bother with specific application programs when XDMS does it all!) So put the joysticks aside, load in XDMS, and get some real use out of your CoCo - It's time has come...

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FLEX is a trademerk of Technical Systems Consultants, Inc.

REVIEW

COMPILER EVALUATION SERVICES By: Ron Anderson

The S.E. MEDIA Division of Computer Publishing Inc., is offering the following 'SUBSCRIBER SERVICE':

COMPILER COMPARISION AND EVALUATION REPORT

Due to the constant and rapid updating and enhanchment of numerous compilers, and the different utility, appeal, speed, level of communication, memory usage, etc., of different compilers, the following services are now being offered with periodic updates.

This service, with updates, will allow you who are wary or confused by the various claims of compiler vendors, an opportunity to review comparisons, comments, benchmarks, etc., concerning the many different compilers on the market, for the 6809 microcomputer. Thus the savings could far offset the small cost of this service.

Many have purchased compilers and then discovered that the particular compiler purchased either is not the most efficient for their purposes or does not contain features necessary for their application. Thus the added expense of purchasing additional compiler(s) or not being able to fully utilize the advantages of high level language compilers becomes too expensive.

The following COMPILERS are reviewed initially, more will be reviewed, compared and bench- Color Computer is powerful enough to marked as they become available to the author:

PASCAL "C" GSPL WHIMISCAL PL/9

Initial Subscription - \$39.95 (includes 1 year updates) Updates for 1 year - \$14.50

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GEOGRAPHY

PAC

The most recent bad news affecting us as a nation on a long-term basis is that our educational system is failing. Compared to some other industrial nations, the U.S. is not bringing into the adult world a well trained individual who can adjust quickly to the changing job environment, much less function effectively in a competitive situation. The warnings signals are clear, and we will suffer for it if changes are not

made quickly.

Educators can argue all they please about the correct solutions that are needed in the school systems to rectify the problem, but I don't see them doing anything substantial real soon. Why? Obviously, there is too much politics, not enough money, seniority (tenure) eliminates any desire to stay "up with the times", and fear of change, that control the public systems. Blatant failure on the part of students entering the adult world will cause many systems to change quickly. Some will make the necessary changes to reverse the present trend and move forward, while others will introduce some theoretical ideas for helping the students, and find very shortly something is still missing. What? What will they find missing, the Basics. Yes, the fundamental basics of reading, writing, comprehension of the first two and of course math and science skills.

Well this all sounds pretty complicated! Well it is! How is this article going to help? Well, there is no doubt that the computer is the tool of the future, and many schools and parents are recognizing that fact. Also, I believe the Color Computer to be the best all around purchase for people who must watch their budgets. There is lot of software floating around out there that is priced just right, that does not fool you with marketing magic, and is probably the thing your looking for to help a learning individual gain an advantage on the learning process. Th Color Computer can assist the learning process by reinforcing the basics in education through good software. The allow programmers of educational software to be very accurate and detailing in their programs. The computer will not grow tired of a student giving the wrong

A good educational piece of software will ask dood diestrous on the AstA basics of subjects. It will have the ability to become more difficult as the student gains knowledge, and will challenge the students abilities as needed. These articles will help you spot the good, stuff without you having to take a chance. My articles are not going to try to put forth any great theories of mass education or doctrines of better learning, or any other types of confusing thoughts that seem to depress you rather than help things. You see, I believe that no matter what is happening in the school, if I as a parent can watch with

care my childrens progress in school (and I don't mean just looking at a report card every nine weeks or so), I can attempt to help in areas where the school system as a whole, or maybe the individual teacher, failed to pass on to my children the necessary tools for developement. The Color Computer just happens to be one of the greatest tools for me and my children to accomplish these basic goals in education. The Color Computer, and available software, will save both me and my children time in the learning process. Another benefit, other than the time savings, the Color Computer can bring is that the Color Computer is powerful, exciting and able to handle a multiple of operating systems that allow me access to more software collectively than any other single personal home computer on the market.

I will be reviewing computer educational software for the Radio Shack Color Computer. I will try to describe how it works, how it does not work, and if it IS what some advertisements or marketing procedures accurately describe, it's ability to help a student (is it

worth the money).

I openly invite anyone to criticize what I have to say on any subject I review or talk about. I invite any person or company to submit educational software for review. Don't hesitate to send your letters or software. While my schedule is always under pressure, I will attempt to answer all letters and, as quickly as is humanly possible, review all software submitted. Pleasel Take note that I am a firm believer that anything worth saying, is worth writing down. So, please do not call me on the phone to either argue or praise any article. However, I appreciate phone calls that can pass along important information or facts affecting educational software or the microcomputer industry when a letter is too slow or cumbersome for the intended results.

> GEOGRAPHY PAC from SPECTRAL ASSOCIATES 3416 S. 90th Tacoma, WA 98409

16K Ext. BASIC, Tape \$33.95 32K Ext. BASIC, Disk \$37.95

Let me start by saying that SPECTRAL ASSOCIATES has a great piece of software in Geography Pac. Wayne Thume, Virgil Hall and others did a fine job in programming this educational software.

Geography Pac is an enjoyable, easy way to learn geography. Geography Pac is a collection of five Extended Basic programs designed to teach the topological location of countries (or states), their capital, largest noncapital city, major industry, and currency (or statehood date). A fourcolor high resolution map is used. A separate program for the U.S., Europe, Asia, Africa, and South/Central America is available separately or together as the Geography Pac on cassette with good directions for transfering to disk.

A 16K Color Computer with extended Basic is required.

NOTE: All programs will work in 32K and 64K machines, but none will work in 16K Disk. You must have at least 32K if you are running Disk.

running, comes up with a map of the USA. choice of taking the "FLASH TEST" is given. I did not wish to take the Flash Test at first. Once I responded with a CLOADM "AFRICAP", CHECK enter. on the keyboard I was asked

"Bow Many States Would You Like: 50?".

Use your up and down arrows on the keyboard to change the number of states

"What Type of Questions Would You Liker"

- States Only
- . All Questions
- C. Raudon
- D. Capital . Industry
- . Cities
- G. Statehood

In choosing "A. States Only" the fourcolor map reappears with the state to be named flashing for a few seconds in a different color. When ready to name the state you simply hit return and

"Type the Name of This State"

appears on the screen at which time you give it a try. If the name is misspelled or just flattly named wrong, a little tune is played and the correct answer is displayed on the screen.

"Press Space Bar To Continue"

if you have asked for more than one state.

If you had selected B under Types of Questions, you will be asked

"All questions".

Name of State Capital Major Industry Statehood Date Largest Non-Capital City

All other selections under types of guestions are as they read.

A percentage score is given upon completion of each section. A choice or either playing again or stopping is

When using "FLASH TEST" you are asked if you would like a "SLOW", "MEDIUM" or "FAST" Flash. The map of the USA is shown with the state in question Mashing.

Depending upon your choice of speed, the outline of the USA and state disappear from the screen and you are asked to name that state. You have got to be quick and good. A percentage score is given, and the opportunity to **pla**y again is given.

Geography Pac rates very well on my List of good educational software. GEOGRAPHY PAC meets several important features of good educational software. **GEOGRAPHY PAC** is informative, challenging, powerul, simple or sophisticated (your mhoice), enjoyable and easy to use. There is nothing complicated about Geography Pac. It is straight forward and well worth the investment. Another great feature of Geography Pac is that it can be used by 1st graders through idults.

The only criticism of Geography Pac Geography Pac, once loaded and that I found was in the instructions for transfering to disk; step #3 had a misprint and should read,

Also there are a few bugs in the programs where you are asked to give a statehood date. Two places when entering the statehood date, the date would not be accepted by the computer. desired. After doing this the screen This was only a minor problem as I listed the program out and made the correction in the listing myself. Current versions of Geography Pac should not have these bugs. This piece of educational software, "GEOGRAPHY PAC", passes the test easily with very high marks.

Larry E. Williams

COCOPRO P. O. Box 37022 St. Louis, MO 63141

NEW PRODUCT RELEASE

Dual Cassette Copy System

Emerald Systems and Program Products team up to produce the ultimate cassette tape copy system. Introductory offer!

Two cassette tape recorders are used with your TR5-80C Color Computer. The Color Computer LOADS from one cassette recorder and SAVES to the other under the control of unique and powerful machine language software.

You can copy cassette tapes without the tedium and frustration of changing cassettes after each program is LOADed or SAVEd. DCCB will start copying with the first file encountered or at a specified file name. DCCS will automatically adjust to your memory size up to 64k and display the amount of memory remaining when LOADing programs. You can select I to 9 copies of each program. You can even force it to copy a file that has a tape read error.

DCCS is a simple to use menu driven copy program. The default modes will copy each file encountered on the first cassette one time onto the second cassette. Normally, files with errors will be bypassed. As files are read and copied, a directory is generated on the screen showing the length of Basic programs and data files and the start, end, and transfer address of machine language programs. A blank leader of eight seconds duration is automatically placed between all files recorded.

From the menu, you can change the number of copies to be made, select that the copying begin at a specified filename, and force copying of files with tape read errors. While the copying is underway you can enter a keyboard character which will cause the operation to payer at the next possible step without aborting the ongoing procedure.

Includes program on cassette, motor control adapter cable for the second cassette recorder, and complete instructions.

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EVERYTHING



If you have a disk drive, you know how important it is to back up your disks. Virtually every book on computers tells you to back everything up, and many recommend at least two backups. That is simply good computer practice. However, the BACKUP command on the color computer will only handle disks with a standard format, so many disks could not be backed up.

Enter OMNI CLONE. This amezing program handles most any non-standard disk with ease. It handles variable sector lengths, non-standard sector and track addresses, deleted address marks, forced CRC errors, un-formated tracks, any amount of sectors, any number of tracks (up to 80), and single or double density. **OMNI CLONE** is 100% machine language, and it is completely self-contained. It has its own disk drivers and keyboard scan, it uses no ROM calls at all,

Unlike many programs of this type, you don't need to know anything about the disk you want to clone. OMNI CLONE does it all for you, including the formating of the destination disk, and it's all automatic. Don't ever be caught without a backup again! We can't promise that OMNI CLONE will back up any color computer disk, but we haven't found any yet that it can't handle. It has even backed up some Model III diskell OMNI CLONE can be used with either one or two drives and requires 32K to run.

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REVIEW

FORENCK from SOFT CITY 442 SUNNYSIDE WHEATON, ILL. 60187

Tape \$16.95

ROMBACK is a utility for a 64K COCO from Skyline Marketing on cassette. It makes cassette backup copies of ROM Packs. Disk copies can then be made. The instructions are complete and easy to follow, even giving "POKES" for MICROBES, SPECTACULAR (which adds another 8K storage), MICROPAINTER, BASIC AID, and MEGABUG, to bypass protection. It also displays beginning, end, and execute addresses on the screen in HEX to use in "SAVEM" commands for Disk copy. A screen prompt asks you for a filename, and if you are ready for the copy to the cassette.

You must tape over pin 8 on the ROMPAK before you plug it in and power up CoCo. ROMPACK then checks the size of ROMPAK memory, and adds a special loader program that executes the Copied Program when you enter "EXEC" after loading the Taped Copy, which loads and runs it in high memory.

RUSSELL ROBERTS
CHATTANCOGA CHOO-CHOO SOFTWARE

>>> HELPFUL HINT <<<

User Defined Functions in BASIC

Extended Color BASIC includes the ability to create USER Defined Punctions by using the "DEF FN" Statement. A User Defined Function can be used just like a System Supplied Function (such as SQR).

One way to use a User Defined Function is to add new 'statements' to BASIC'. As an example, I had always wanted a 'DPEEK' statement to read the contents of two bytes from memory.

To define a function to do this, we could use the code;

10 DEF FMD(A)=PEEK(A)*256+PEEK(A+1) at the beginning of a program.

We could then use this function to determine the Current Cursor Location on our Text Screen. The cursor address is stored in locations \$88 and \$89, which contain an address in the range \$400 thru \$5FF.

100 CL=FND(&H88)-&H400

There are many other uses for User Defined Functions. If you come up with any, share them with the rest of us who read the Chicr Micro Journal.

Troy Brunley

OB and Hud

TRS-80+ MOD I, III, COCO, TI99/4a TIMEX 1000, OSBORNE, others

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REVIEW

MIZARD 64 by Chris Hawks

Distributed by SKYLINE SOFTWARE 442 Sunnyside Wheaton, IL. 60187

Requires 64K Extended BASIC Tape \$21.95; Disk \$23.95

This is a combination of Two 32K BASIC Programs, WIZARD'S TOMB Part One and Part Two. The Disk Version I tested dame with only a single page of instructions, which said to type "RUN WIZARD64", and little more. The program, once loaded and run, leaves less than 4K of memory, so a true 64K machine is necessary. WIZARD 64 is a Text-type Adventure which has graphics pages to add interest. The program allows only single letter commands to be entered, so your actions are somewhat limited.

The program begins by giving you a brief background on why you are here and what you will encounter. Then you are ask for your name and how many players there are (there can be up to four). You are then ask for the other player's Be sure you remember how you spell the name you use, because the program will not take anything except the initial spelling. Then you will be assigned life and ability points; if either of these reach zero, you will be DEAD! These points are sometimes quite low, so be careful; each fight brings you closer to death, and there is no way to renew them. At last you are conducted to the Inn and told to equip yourself from the list of items, but you can only carry three. Choose carefully

you are shown a map of the countryside (no indication of where you are), and ask which direction you want to start in. As you go toward the Wizard's Tower, you encounter various monsters which you must fight; no evasion is allowed. If you are lucky, you will reach the Tower and gain entry. Once inside, you must search for the Wizard's Tumb. This is where the first adventure apparently ends, but in WIZARD 64 there is no treasure here, so you must find your way on down into the lower catacombs. On the lowest level, you will find the Wizard's treasure; then you must find your way back out again. There are treasures and monsters a-plenty along the way. Oh; one other thing! You aren't allowed to LEAVE until the Wizard's treasure IS found.

WIZARD 64 is an interesting game for the Text Adventure fan, but will not hold great interest for those who want Graphics; there are only three pages for fights and the map. The game is well thought out, and will keep you guessing until the last, as the room descriptions on different levels are identical; but you will not always get the same results from the same actions. After the game is loaded, it calls a Machine Language program that sets up two memory pages, moves the first program, and loads the second. This is an excellent ML routine for those with 64K, as it allows loading much larger BASIC Programs. The possibilities are unlimited, so try the game and enjoy it.

Joe Patrick

SYSTEMS SOFTWARE

for your program. assembler and Plus it leaves we eliminate tedious program loading when going back and forth from editnent System (SDSB0C) is a complete 6809 editor, assembler and HAM based for Computer non-volatile meaning that if your application program bombs, if he Micro Works Software Develope monitor package contained in one Co almost all of 16K or 32K RAM tree for can't destroy your editor/assembler. Vasily superior rs, the SDS90C Since all three programs, editor, are co-resident, assemblers/editors, program pack! **Monitor**

of the screen The powerful screen-oriented Editor features finds, All keys have since no line may be used to generate well commented code. changes, moves, copys and much more. convenient auto repeat (typamatic), and numbers are required, the full width ing to assembly and debugging!

The Assembler features all of the following: complete 6809 instruction set; conditional assembly; local tabels; assembly to cassette tape or to memory; Ho error codes to screen or printer, and mnemor instead of numbers.

The versatile monitor is tailored for debugging proand Editor. 11 reatures examine/change of memory or registers, casesette load and save, breakpoints and more. **SDS80C** grams generated by the Assembler Price: \$89.95

BATT MICHO WORKS COLOR

bly Language Forth is faster to program in than Base Forth is easier to learn than Assem

Forth is a highly interactive language like Basic, with structure like Pascal and execution speed close to ing you need Works Color Forth executes in less time than Basic that of Assembly Language. The Micro Forth is a Rompack containing everyth to run Forth on your Color Computer

sticks, and sound. The 112-page manual includes a FIG glossary and complete source listing. COLOR for learning the inner workings of this fascinating language. It will run on 4K, 16K, and 32K computers. Color Forth contains 10K of ROM, leaving your RAM language plus for your programs! There are simple words to effeca full standard FORTH ... THE BEST! From the leader in Forth **JATH Interest** most of FORTH-79. It has a super screen editor with and other aids graphics, Joy on cassette spill screen display. Mass storage is Cofor Forth consists of the standard Fi Color Forth also contains a decompiler tively use the Hi-Res Color Computer glossary of the system specific words. Group (FIG) implementation of the Talbot Microsystems, Price: \$109.95

P.O.

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on-the

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printer that will work with the Color Computer, even if it requires line feeds! But even if you don't have a printer, you can keep a permanent copy of your data The Microtext module is a program pack containing both your printer and modern can be connected at the same time. Microtext can be configured for any serial by storing to cassette tape. Also, any Radio Shack/ Centronics-compatible parallel printer may be used not only firmware but a second serial port so that by adding the Micro Works' PI80C parallel interface.

bits. All 128 ASCII codes can be sent. Exchange pro-For those of you with special terminal applications, mark or space. With mark parity (which is default) you can send to computers requiring either seven or eight grams with other Color Computer users! Basic programs may be downloaded from other computers or Microtext has selectable parity; it sends odd, even timesharing systems. You'll find many uses for this versatile module! Available in ROMPACK, ready-to-use, for \$59.95.

MACHINE LANGUAGE

MONITOR TAPE: A cassette lape which allows you to directly access memory, I/O and registers with a formatted hex display. Great for machine language programming, debugging and learning. It can also sendfreceive RS232 at up to 9600 baud, including host system download/upload. 19 commands in all. Relocatable and reentrant, CBUG Tape Price: \$29.95

supplied in 2716 EPROM. This allows you to use the entire RAM space. And you don't need to re-load the monitor each time you use it. The EPROM plugs into the Extended Basic ROM Socket or the Romless Pak ROM; The same program as above, I. CBUG ROM Price: \$39,95 MONITOR

ROM. Also included is a documentation package which gives useful ROM entry points, complete memory map, Wo hardware details and more. A 16K system is required for the use of this cassette. 80C SOURCE GENERATOR: This package is a disasales your own source listing of the BASIC Interpreter sembler which runs on the color computer and gener Disassembler Price: \$49.95

MACHO-BOC

This is a disk-based action, macro assembler and monitor, written for Cotor Computer by Andy Phelps. THIS IS IT — The ultimate programming tool!

source format. There are no changes, constraints or shortcuts in the source language definition. Incorassembler (SDS80C), MACRO-80C contains many more useful instructions and pseudo-ops which aid tional assembly, local tabels, include files and cross referenced symbol tables. MACRO-80C supports the complete Motorola 6809 instruction set in standard porating all of the features of our Rompack-based The powerful 2-pass macro assembler teatures condithe programmer and add power and flexibility.

The screen-oriented text editor is designed for efficient and easy editing of assembly language programs. The "Help Key" feature makes it simple and line numbers, you can use the arrow keys to position the cursor anywhere in the file. MACRO-80C allows global changes and moving/copying blocks of text, fun to learn to use the editor. As the editor requires no You can edit lines of assembly source which are longer than 32 characters.

DCBUG is a machine language monitor which allows examining and altering of memory, setting break points, elc.

sample programs — come on one Radio Shack compatible disk. Extensive documentation included. Macro-80C Price: \$99,95 The editor, assembler and monitor — as well as

PARALLEL PRINTER INTERFACE — Serial to parallel PIBOC plugs into the serial output port, leaving your Rompack slot free. You supply the printer cable. PIBOC converter allows use of all standard parallel printers Price: \$69.95

soldering experience) Price: \$39.95. For Rev. level E., ET, NCand TDP-100s, we carry 64K chips; upgradingle Integrated circuits, with instructions for installation. 4K-16K Kit Price: \$38.95. 16K-32K Kit (requires easy! Eight prime 64K chips and instructions; \$64.95 MEMORY UPGRADE KITS: Consisting of 4116 200ns.

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6809 Assembly Language Programming, by Lance

Leventhal, \$16.95

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Assembly Language Graphics for the TRS-80 Color

Starting Forth, by L. Brodie, \$19.95

Computer, by Don Inman, \$14.95

Pac Attack - Try your hand at this challenging game by Computerware, with fantastic graphics, sound and action! Cassette requires 16K. Price: \$24.95 field in this action-packed Hi-Res graphics game. Available in ROMPACK; requires 16K. Price: \$39.95

Star Blester - Blast your way through an asteroid

GAMES

Haywire — Have fun zapping robots with this Hi-Res game by Mark Data Products. Cassette requires 16K. \$24.95 Dunkey Munkey - Arcade excitement awaits those who dare to conquer the Munkey! Joysfick and 32K required, by intellectronics. Cassette: \$24.95

Cotorpede - Great graphics, two-player option, and pause control in this exciting game by Intracolor Communication. Cassette requires 16K; \$29.95

Adventure — Black Sanctum and Calixto Island by Mark Data Products, Each cassette requires 16K; \$19.95 each. Cave Hunter - Experience vivid colors, bizarre sounds and earle creatures in hot pursuit as you wind your way through a cave maze in search of gold reasures. This exciting Hi-Res game by Mark Data Products requires 16K for cassette version, \$24.95 Starline — Fly around the planet defending Earthlings from being snatched up by aliens in this challenging game from intellectronics. Cassette requires 16K.

move quickly through mazes while being chased by enemy bugs in Hi-Res game by Computerware. Doodle Bug — Joystick-controlled Doodle Bugs must Cassette requires 16K: \$24.95

Earth from wave after wave of allen invaders in this HHRes game by Mark Data, Cassette requires 16K; Astro Blast - You'll need to act fast as you protect



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The CASE of the SILVER CoCo

Some folks seem to think that the silver case on the CoCo bears a striking resemblance to the plastic space toys seen in various stores around; I happen to be one of those folks. And, apparently, there are more like me hanging around Tandy Towers, because all their new computers are coming out with some version of a molded-in grayishwhitish-tanish color. When the silver started flaking off badly from the corner of my own CoCo, especially where I rested my right hand, I figured enough was enough.

But, wait! That color showing through the silver looks like a molded-in grayishwhitish-tanish color. Are they really hiding the new color under all that silver? Homm. I have some methylene chloride here; I wonder what would happen if ??? Well, if you have easy access to some of that stuff to strip your CoCo with -- DON'T--! It will eat your case alive

I'm sure there are other solvents around that will do the job, but I found that 1,1,1 TRICHLOROETHANE works perfectly (I'm told that they also use it to decaffinate coffee.) It isn't really fast, and takes some rubbing, but, after you have gotten all the little silver flecks off, it leaves a very finely etched finish which would credit any business machine. And, it seems, the longer you rub the nicer the etch. Such a fine etch will likely take a shine if rubbed often, but a few licks with the solvent will cure that.

Use a clean cloth eight or ten inches square, and have some spares handy; the silver builds up in the cloth, quickly

turning it black. Use enough solvent to and Acetone are both in this category. make the cloth wet, but well short of Lacquer thinner has considerable dripping. You'll probably have trouble variation from one brand to the next, and getting the silver out of the groove from one type to the next; each has around the keyboard. Squeeze a few drops of solvent into the groove, keeping it level. In fifteen or twenty seconds you should be able to get it out with a too "hot" for the job. cotton swab. A fingernail works well to get the very bottom corner, if it is still Oh, yes. Just one more thing. I don't

When everything looks free of the silver color, get out another clean cloth, and do the whole thing all over again. You'll be surprised how much more you can still get off, and you can also work on rubbing out any shiny spots. Any streaky look will also probably disappear with this going over. If not, do it again with another cloth.

You may have other solvents you'd like to try. If so, put a small drop on the bottom for a few seconds to see what one I have. happens. Some solvents will rapidly soften both the finish and the plastic. Methylene Chloride, as mentioned above,

different percentages of the three solvents already mentioned, and/or others as well. Some lacquer thinners may be

advise doing the job even close to the computer board. Even the vapor could cause unwanted damage. And, for plenty of ventilation, I did mine outdoors.

So, there you are. If you don't care for silver, and have a better color under it (surely, you have some rubbed-off spots on your CoCo by now - I understand that some of the early cases were molded with black plastic), give this a try. I think my new molded-in grayish-whitish-tanish color is just gorgeous. Now, I just wish I could find a real keyboard under the

Jim LaLone



Press Release

E.A.P. CO., PO BOX 14 KELLER, TEXAS 76248 Introduces the GOLD PLUG-60 for the Radio Shack Color Computer*. The COLD FLOG-80 eliminates the problems of poor contact at the card edge connections of the Disk Controller Module, and the Disk Drive Cable at the Module and Dick Drives. The poor contacts usually cause disk directory errors making the disk data unaccessable. The data or programs on the disk are lost. Ground tab extensions are included in the disk module kit. The ground tab extensions contact the ground clips on the COCO female connector. The GOLD PLUG-80 extends the existing connection 1/2". The ground tab extensions extend the ground tabs 1/2" to contact the ground clips. This ground reduces the RFI interference to the monitor. The ground tab extensions are only required on the disk module or the external module box.

Installation of GOLD PLUG-80 on modules available. Inquire,

The GOLD FLUG-80 for the COCO Disk Module (both ends) including ground tab excensions is \$16.95. The GOLD PLOG-80 for the external module box or the computer and only of the disk module including ground tab extensions is 98.95. The Disk Drives or ROM modules are \$7,95 ea. A Gold Plated Drive Cable is recommended and available from E.A.P. CO. For \$29.95/two drive and \$39.95/four drive. The female connector in the COCO is usually gold plated if not a replacement is available for \$8.95.

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REVIEW

TRS-BEC MILITI-PAK INTERPACE

From RADITO SHACK A Division of TANDY CORP. Fort Worth, TX 76102

\$179.95

The TRS-89C MULTI-PAK INTERFACE from Radio Shack allows you to plug in up to four different RCM Paks at the same time, and lets you switch between them by a Hardware Switch on the front, or by Software pokes. It is just the thing for those of you who have been trying to deal. with the explosion of ROM Paks without wearing out the Expansion Slot Connector on the computer.

The Radio Shack Multi-Pak Interface comes in a color-coordinated case that matches the color computer's silver-grey color and design. It plugs into the cartridge slot, and extends the computer's width by twelve inches; it is eight and a quarter inches deep. The slots are located on the top of the unit. The Disk Controller and ROM Paks are installed vertically, while the Interface plugs snugly against the side of the computer. It requires a grounded type (3-prong) AC outlet.

The MULTI-PAK Interface was apparently designed in response to the people who complained that they could not easily save Graphics produced on the X-Pad to Disk, as this use is prominently pointed out in the owner's manual. The slots are selected either by the switch on the front, or by software selection, by Poking 65407 with 00 for \$1, 17 for \$2, 34 for #3, and 51 for slot #4.

- NOTE -

The Manual states that this address is 65439; the Addendum correct's this error to 65487.

When you select a slot by Software, you loose the front panel switch controls until you reset the computer. By using the Rom-disable poke (POKE &HFF23,36), and then selecting the slot it's in, you can examine the ROM Paks.

There is a handy hint in the manual that tells you that if you leave a slot empty, you can easily switch between Extended Basic and Disk Basic by moving the switch to the empty slot and pressing RESET. This is another neat way to save unplugging the disk controller.

Of all the other adapters on the market, this is the only one that has the same styling as the CoCo, and it includes a heavy duty power supply to boot. The Radio Shack Multi-Pak Interface is a good investment in the health of you computer, especially if you like to experiment with ROM-Paks, and will save your Expansion Connector from wearing out if you have more than the Disk Controller. So read the ads, compare features and power supplies, consider the Cartridge Support that Radio Shack has NOW and WILL HAVE in the future, and then make your own decision. Mine was in favor of the MULTI-PAK.

Joe Patrick

Press Release



NEW PRODUCT RELEASE

HAGIGRAPH

The Micro Norks is pleased to announce the release of a graphic development utility for the Radio Shack Color Computer. experienced Basic and assembly language programmers. The program simplifies the task of drawing highly detailed graphic characters, up to and including an entire MagiGraph has a full set of high-resolution graphic screen. and pixel manipulation functions that coeration simplify the development of a character in all its different possible color and position combinations. The program offers nine animation buffers, which allow the various positions of an animated character to be tested and revised so that animation blands together smoothly. Finally, the pixel codes of a graphic character can be listed in hexidecimal numbers to a printer, and the graphic screen can be saved on cassette tape or floppy disks to be used later by another program or revised with MagiBraph.

MagiBraph, written by Kevin Dooley, is available on cassatte for \$34.95(16K required); disk for \$39.95(32K Extended Color BASIC required); Aediak cartridge for \$44.95. documentation and plenty of mample programs are included in the package.

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BULLETIN BOARD SYSTEM

FLEXNET BBS

The FLEXNET BBS (405-722-6809 in Oklahoma City) is an unusual Bulletin Board System, in that it more resembles an Operating System than a traditional BBS system. It is an adaptation of the FLEX operating system from Technical Systems Consultants (TSC). I see a great advantage for the experienced user of FLEX, as he can go right to work on this BBS. For those unfamiliar with FLEX, it may take a little time to get used to the system; but think of the opportunity you have to learn how this great Disk Operating System works.

I, like many others reading this, was introduced to FLEX through my purchase of a TRS-80 Color Computer, and was a little taken aback with the price of the FLEX programs. Most CoCo owners selected their computer for one reason: they didn't have a lot of money to spend. Taking into consideration that the computer was only a couple of hundred dollars to start with, well, you get what you pay for - especially with the limited operating system that RS offers with the CoCo.

I see the PLEXNET BBS as being a great service to the Color Computer owners in two ways. First, it allows the

a FLEX-like system before he buys a copy. Second, there are lots of FLEX utilities available on FLEONET; written by other FLEXNET users. This is a great way to enhance your FLEX library, and learn a heck of a lot at a minimum expense. The programs are in both source and object form. There are Communications Programs that you can download in source form, and then assemble, that will allow you to download machine language files. Initially you would have to purchase a copy of FLEX and an Assembler if you wanted to use some of the FLEX utilities (some FLEX Conversions include the Assembler). There are also a lot of free download programs on the system that will run under RS Disk BASIC.

Another nice feature of this BBS is that there are many knowledgeable people on the board, with a lot of info about FLEX and the 6809 in general. If you pose a technical question on the BBS, there is a good chance you'll get it answered.

When you check into the board, you will get a short greeting message and then the prompt "FLEXNET". I thought a lot of being able to check into the BBS without having to give my name; this is the first one I've ever seen like that. When you get the prompt, it's the same +++ that is used by FLEX; you give it a FLEX command, and it's off and running. An example would be CAT; this would give you a catalog of the disk files. DIR gave me a more expanded directory of what was on the disk, and DIR I gave me a further directory of what was probably on potential purchaser of one of the fine another disk drive. Another interesting

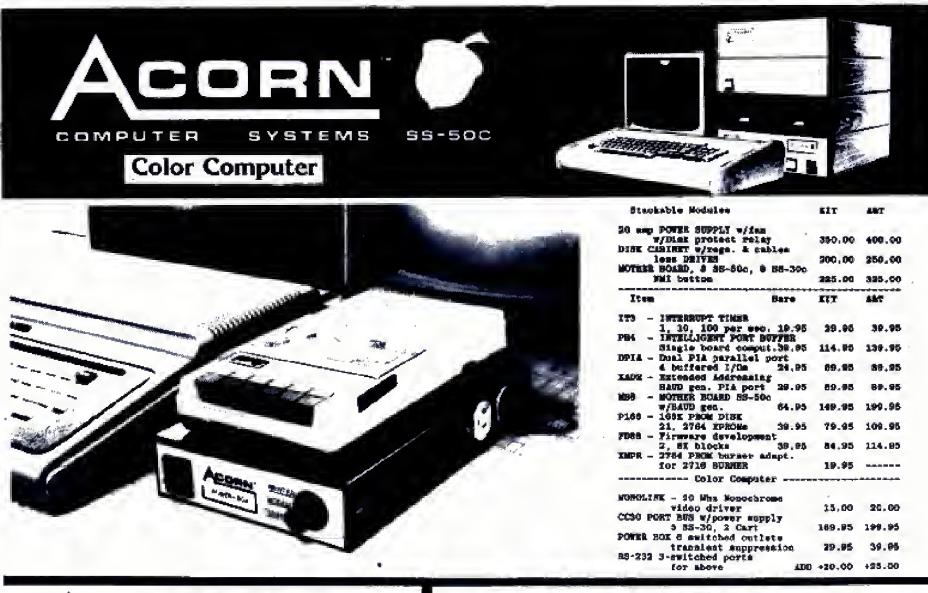
FLEX implementations for the COCo to try directory-type command was called FILES.CMD; this was very handy because you can get a directory of files that have specific characteristics. For instance, if you only want a directory of files starting with "A," type FILES A, or if you want files with just the .TXT extension, just type FILES .TXT (many of the FLEX Utilities work the same way -CAT, DIR, COPY, etc.). To list a file that might be of interest, one would type LIST FILENAME.EXT. The command LISTNEW <MM DD YY> will list all the files dated on or after the date you specify. This will allow you to look at all the files you want to without typing in each filename individually.

> If you check into FLEXNET and forget what to do, you can just type HELP and the system will walk you through it. The same goes for any command you may have a question about. For example, if you want more information about the command file SEND.CMD, just type HELP SEND and the system will give you instructions on using the system's file transfer capability.

> You can leave a program, message, or any other text-type file on the board using the FLEX command BUILD FILENAME. Again, if you are not familiar with FLEX, just type HELP BUILD.

> If you want to know more, I would recommend checking into this very interesting BBS system. There are some pretty dull and poorly run BBS's in the country, and this is definitely not one of them. My hat off to Roger Walton and Bill Holland.

> > Bob Rosen Spectrum Projects



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THIS 'N THAT

Continued from page)

active, because the Interrupts are turned off to allow the Double Density Disk Operation with the 0.9 MHz Clock mpeed of the CoCo. One bug has turned up, which will obviously be fixed before the System is released from the stores [not bad for a System of this complexity).

So, just WHAT is OS-9? To REALLY find but what OS-9 is and does, you will have to use it a while; you can begin to get some idea of what it can do for you by reading the reviews and discussions we will have over the next several months. This issue contains an "In Depth" look at the Manuals that come with the System.

OS-9 was developed in conjunction with Microprocessor Chip and the BASIC09 Programming Language by Microware Systems Corp. and Motorola Inc. One of the primary aims in the design of the 6809 was to develop a MPU Chip that would operate efficiently with the Compiler oriented Structured Programming Languages of today (which were just beginning to appear at that time). Since BASIC is such a popular Language, it was decided that a "Super" BASIC should be developed for the "Super" MPU. As BASIC#9's development progressed, it became apparent that the "usual" Operating Systems would not allow proper utilization of the features that were being build into BASIC09, so an suitable Operating System.

Since UNIX was developed "BY Programmers FOR Programmers", it had many of the desired features, but it was designed for operation on the BIG Computer Systems. Some of it's features could not be EFFICIENTLY used on lower-cost Computer Systems, such as the process of saving to mass storage the "present program state" and loading in a new program EVERY TIME THE SYSTEM SWITCHED TO ANOTHER USER; at the Multi-Meg Transfer Rates that THEY use, that procedure works fine, but for the smaller, slower Systems that would be using the 6809 Processor, that was deemed to be an unacceptable bottle neck. A new approach was required.

This led to the "Memory Module" concept of Memory Utilization that differentiates OS-9 from most other Microprocessor-Based Multi-User Operating Systems. The ease of developing Position Independent, Recursive Code for the 6809, combined with the exceptional Addressing flexibility, multiple 16 Bit Registers, dual Stack Pointers, Direct Page control, etc., allows OS-9 to make maximum utilization of the available Memory Space by loading Programs into that space at ANY location, and that can be shared by multiple Users. It was decided to make OS-9 a "Modular" Operating System, providing a flexibility unheard of in a MAJOR Operating System. Different Modules are linked together by "Data Tables" that describe specific features of the various devices. This allows OS-9 to be used for anything from a simple industrial controller to a major Multi-User, Multi-Tasking Disk Operating System, by simply choosing or changing the required modules and writing a few data tables. OS-9 Systems can be ROM-Based, RAM-Based, Tape-Based, Disk-Based,

Computer Systems. Software support for OS-9 is just beginning a rapid growth, as the Programming Languages running under the System are EXTREMELY Powerful. Languages such as BASIC09 (which may be available as you read this), Pascal, C, Cobol, etc., will be running on the CoCo OS-9 System shortly; as will Word Processors, Data Base Management Systems, Electronic Spreadsheets, Accounting Packages, etc. We see "feverish" activity in support of this package, making the future rosy indeed. the development of the 6809 We also have several Reviews this month,

and I would like to point out one in particular. Jack Lane reviewed the excellent Elite*Calc Electronic Spreadsheet Program, but ran into a small problem with it. We sent his review to Elite Software for their comments, and received some excellent comments from them, which are included following the review. The point is this; their comments provide a lot of insight into why the program was written the way it was, what kinds of decisions and trade offs they had to make in designing it, etc. We have offered our regular advertisers additional space during the next year to do exactly what Elite Software did; discuss their product/s on investigation was launched to find a the basis of the HOWs, WHYS, etc. This will help them in providing more detailed

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now, and is fairly well "debugged". It is

being used by NUMEROUS Industrial Control

Manufactures, as well as such companies

as Motorola, GIMIX, Helix, Smoke Signals,

several Overseas Producers, etc., on

their Business and Software Development

OS-9 has been available for a few years information than they can afford to pay for in advertising, and help YOU in learning more about the products, and what is involved in developing them. I am sure that THEY would like to hear YOUR comments on their products, both pro and con, also. The PROVIDERS need to know what the CONSUMERS want and need; your comments, either directly to them, or through letters to Color Micro Journal, will help them in deciding what to produce next.

> Finally, as some of you may be aware, Jon Shirley is no longer with Tandy Corp., but has moved on to take over as President of Microsoft Corp. (which supplies a major portion of the Radio Shack Software and Operating Systems). Although we did not always see eye-to-eye with Jon on some things, we ALWAYS knew EXACTLY where we stood with him, and all of us here at Computer Publishing Inc. want to wish him the VERY BEST in his new venture with Microsoft.

> The old Dept. of Computer Merchandising will be broken down into three separate Depts, due to Radio Shack's growth. Ed Juge will become the director of merchandising for Business Computer Products: Mark Yamagata will take over as director of merchandising for Personal Computer Products; and Bill Wash will become the director of Computer Merchandising Services. We look foreward to a long and enjoyable working relationship with the new team at Tandy.

> > --- RLN ---



REVIEW

By: Acesoft Computer Products 1688 North Page Drive Deltona, FL 32725

Tape: \$24.95

Fast Lane, written by Jim Ebbert of Acesoft Computer Products, is one of the better games that I have seen for the Color Computer. It's in Machine Language and requires at least 16K Non Extended Color Basic. The game has very good graphics.

You join the ranks of the rebel forces. They have many men, but the resistance is weak due to a lack of powerful weapons. To get better weapons, they have resorted to stealing weapons being transported from a factory in the Alpha-lota system to the main bese of the Empire. It's not easy. The pilot must cross lanes of heavy space traffic, sneak through the factory, while dodging moving walls and electrified walls, get the "Turbo-Blast Gun", run back through the factory, and return to his ship. Every time the pilot steals a gum, the Empire adds more security devices, like more electrified walls. The game requires eye-hand co-ordination, and it is appropriete for younger children as well as older game eddicte.

Loading the game is done with a simple "CLOADM:EXEC" and does not take very long. Once loaded, you start the game by pressing the space-bar. You use the arrow keys to control the spaceship on the first screen and the little person running around the maze on the second acreen. On the second screen, the controls are a little bit touchy, so I would recommend that you just tap the keys, while on the first screen, it is better to hold down the keys.

You start in on what appears to be rush hour on the inter-galactic spacefreeway. All you have to do is to cross the street. Sounds simple? It's not. There are vehicles completely filling

the screen. They are going up and down while you are trying to go from right to left. You go a little bit faster than the other cars, but it is not wise to play Chicken with them, because the changes of your making it are slim. The vehicles include what look like spaceage trucks, cars, and slow-moving buses. And if this isn't enough, the screen is You have only 10 seconds to get across, so forget fooling around here! After one or two (or three) tries, I got past this screen.

The second screen is the killer. It took me about an hour to learn how to get through. It is a maze with moving walls, doors that open and close, and everything is electrified. You must first go through the maze, then get the "Turbo-blast Gun" and then get out. Getting in was not hard. It took me only ten tries. Getting the gun was the easiest part. You just go up, touch the gun, the gun disappears, and then you go down to the door leading back into the maze. Now comes the hard part. You must then work your way through five doors, as they open and close on you, with the walls moving up and down like giant potato mashers, evoiding the everpresent electrified everything. Getting out the last door isn't enough, because then you have to race e well to the bottom of the screen. Even though you may be fast enough to get this far, timing here is everything because that wall is determined to squash you. However, Jim Ebbert took pity on us and gave us a whole 50 seconds to conquer this screen!

Assuming that you made it through all this alive, you will now be shown your score. Then, after pressing the space-bar, you go back to the first screen, which now has more cars, trucks, and buses. If you clear this screen again, you are back to the second screen but this time with a new wall in your path, forcing you to make another simple turn around it. It's not so simple. Because of the speed of your man, you may end up hitting en electrified wall. After you cleer this screen again, you will be shown your score. third time through the first screen

is extremely hard, for the care block e certain path which was once open. The third time you go to the second screen, there is en additional wall which you must pass. It is set up right between the maze and the gun. It has one door in it, and fortunately, no moving walls. I have yet to get past this screen so I don't know what comes next: but I sure am trying to find out!

Fast Lane has a lot of features I really like, such as displaying high score. It does not save the high score between turning the computer on and off, but it does keep track of the highest score while the game is running, en-abling you to brag about it while you challenge your family and friends. will also give you your score when you are killed. You can then start a new game by pressing the spece-ber. It has a pause feature, too, so that in any part of the game you can just hit "P" and answer the phone, answer the door, or just breathe. To continue, you hit the space-bar.

Fast Lane provides a constant challenge and holds your interest for a long period of time. I have hed it for about two months and I am still playing it. determined to beat it. I think it is a very good game and well worth the

Edward Hefter

The Clear Winner



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Press Release

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Programs in ROM or on disk may be "eltered" with the altered program being seved on a disk file; the resultant file could then be used to program a new ROM, etc.

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To obtain additional information, to request evaluation dealer copies, or to order, contact Bud Fass at the address above.

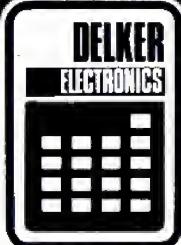
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REVIEW

THE SANDS OF ESYPT

Licensed by DATASOFT to RADIO SHACK Fort Worth, TX. 76201

Requires 16K Extended BASIC and Disk Disk \$29.95

The SANDS OF BEYPT is a very good 16K Adventure Game. It uses Animated Graphics as well as Text to guide you through a somewhat tough adventure. You will die of thirst many times before you are able to locate even the bare essentials for survival. This one is definitely for the Hard Core Adventurer; it will challenge even the best of you. Disks and Extended Color Basic are required, because this program starts out in BASIC, and then switches over to Machine Language. The various scenes are pulled off of the Disk as it needs them. It operates much as the original "Great Cavern" Adventure (Alias Microsoft Adventure, Zork, etc.) did, by accessing only the section you are currently working in, and linking to the others as required by your movements.

As "Sir Percy", you have set out with a group of archeologists to find the Pyramid of Ra, and, being a very proper Englishman who has been critically acclaimed for nineteen books on etiquette, you have diligently tried to teach the other archeologists proper digging methods and how to keep their Khakis etarched. But they became increasingly disrespectful, and refusedto starch their Khakis and have high tea careful. Help is available, but only at on schedule. Thus you found it necessary certain locations, so it's a good idea to to remove some of their privileges.

COLOR COPY

COLCOPY is a menu driven copy utility that copies data files or programs: disk to tape, tape to disk or disk to disk. It also kills files or programs.

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Requires 32K, DOS.

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DEALER INQUIRES INVITED

After five days of argument, you awake on the sixth morning to find that all of your companions have run off with everything except your pocket compass, leaving you stranded in the desert. As you wander aimlessly about the desert, you will discover items of yours that these scoundrels have discarded. If you are VERY lucky, you will manage to find your way to an oasis, and be able to save yourself from dying of thirst. However, this is not easy, as Sir Percy is a very proper English Gentlemen. Emphasis on proper; it was his mania for absolutely proper etiquette that caused him to be abandoned. After all, what working archeologist or guide really gives a fig about the proper time to drink tea? If you manage to stay alive for a while, and find the necessary equipment for survival, the next hurdle is to find the Pyramid, and a way into it. This is harder than finding survival equipment. Thus begins your great search for the Pyramid of Ra. Will it be fame and glory for you, or will you become another bleached skeleton in the Sands of Egypt????

If you tire of searching the desert and trying to find the pyramid, or locate the treasures of the Pharoh, the game DOES have a Save Feature, so you can quit and come back another day. It is a good game, has excellent graphics, and an easy command structure which will accept either single letter or two-word commands. This allows movement without typing in two words, which can be very tiresome. Careful perusal of the manual, as well as the letter from Sir Percy to Queen Elizabeth, is a good idea, because there ARE clues there, but they are subtle and will escape you if you're not ask often.

The Sands of Egypt is a real eye pleaser; graphically. But the fact that the desert seems to move the eame direction when you type South and West or North and East can be somewhat confusing. Also one of the pictures shows two pyramids, but I can only seem to locate one. These were the only annoyances that I noted in the program, but they do not detract from the game's enjoyment. I heartily recommend this game to anyone who likes adventures; and you get the bonus of a very interesting screen. But be warned; this is a hard adventure to solve. It's not for the screws to go in (two screws are plenty faint of heart or easily discouraged. to hold the Board, if you don't jerk the Humm. If I rope the camel then I might..... Oh well, try this one, it's are ready to get all those program interesting. But don't forget to take listings you've been wanting, or use that your etiquette book; you'll need it.

Joe Patrick

REVIEW

Epson Serial-to-Parallel Interface SPECIFIEM PROJECTS \$49.95

Do you have a Color Computer and want a printer for it? Does it seem like all the good deals are just on parallel printers? Or do you already have an Epson Printer and wish you could connect it to your CoCo? Well then, I just may have some good news for you.

The Serial-to-Parallel Interface for the Epson MX-8# Printer carried by SPECTRUM PROJECTS is the SP-1 made by CNR Engineering and is a great buy. It is just \$49.95, compared to about a hundred and fifty dollars retail for Epson's official version. This little board will let you use the Epson with your Color Computer.

There are several features about this board that I really liked. The first one is that it comes with a cable that is over five feet long to connect to the serial port in the rear of the computer. Next are the eight switches on the board to allow proper configuration -- the first three are for setting up the correct parity for your system and the other five allow selection of baud rates ranging from 300 to 4800. The only switch I set to the ON position was the seventh one, 600 band. Also, all the IC chips are socketed on the board, making repair simple if needed. All of the features that I tried with my Printer with Graftrax worked OK with this Board.

Installing the board is easy, although no instructions were included. The four screws holding the Epson printer together must be removed from the bottom, and the Knob pulled off of the platen shaft. After you have removed the top of the printer, look for four posts near the parallel cable connector. The serial board sets on top of these posts and plugs into a socket that is on the printer's main board. Now insert the screws that came with the serial board into the four posts to stabilize the board. This is where I ran into my only problem. Two of the holes did not line up well enough with the posts for the cable). Reassemble the printer, and you word-processing package!

Dan Williams

Color Computer 2 -

The NEW Color Computer 2 is the same and you have 64K RAM in the CoCo 2. width as all of the others, but is only about 2/3 as deep, front to back. A couple of the obvious changes are that the RF Modulator is standing on edge, and there is NO 12VDC supply; it is strictly a 5 Wolt machine. There is also a solder-on fuse on the AC Input.

The 16K RAM Chips provided in the CoCo 2 are pin compatable with the 64K Chips that we have been using in the older Computers (4164); remove the 16K Chips and insert the 64K Chips. There are two "solder spots" about 1/16" apart just to the left of the 6822 Chip near the Keyboard end marked "Mi"; jumper these,

64K & DISK

The Disk Controller MUST have 12VDC to operate. We found that the 5V Regulator supply voltage was close enough; we ran a lead from there to Pin 2 of the Cartridge Slot connector, and the Disk Controller worked OK. You may need to readjust the "Write Pulse" width; ours were close enough (on three different Computers, but all with the same Controller). The SURE way to use the Disk Controller with the CoCo 2 is with the new Multi-Pal Expansion Unit from Radio Shack; it has its OWN 12 Volt Power Supply.

--- RLN ---



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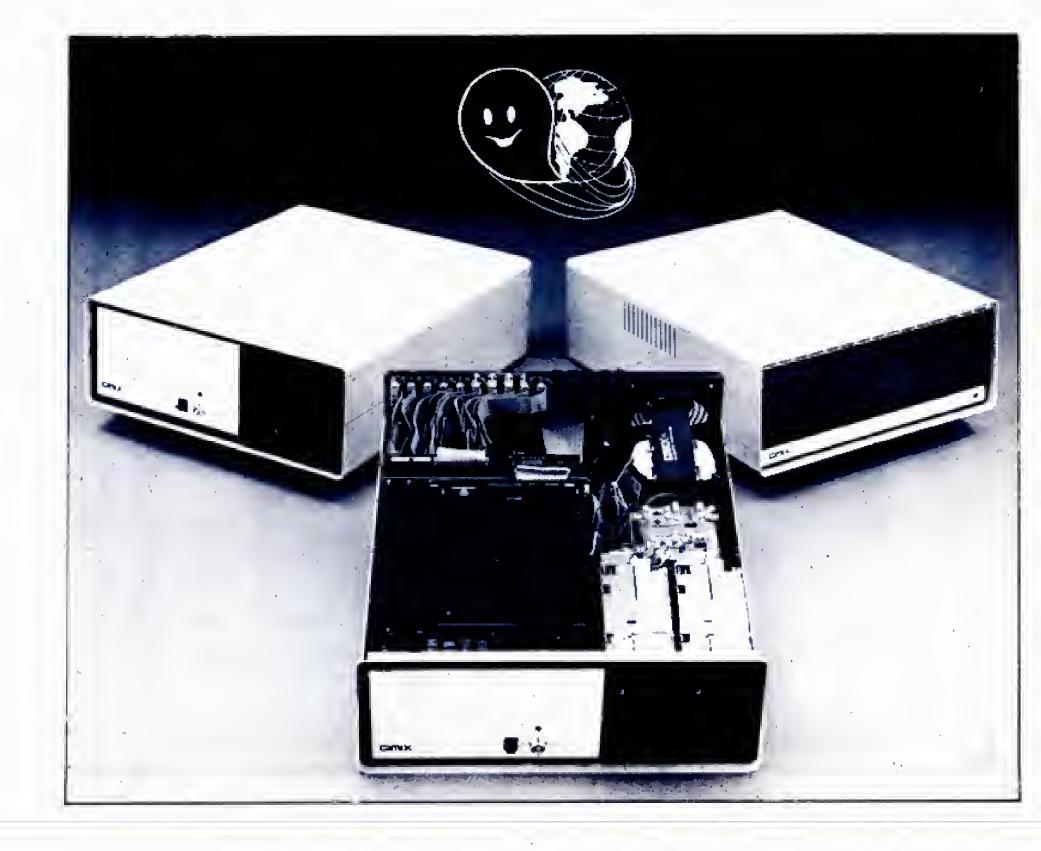
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